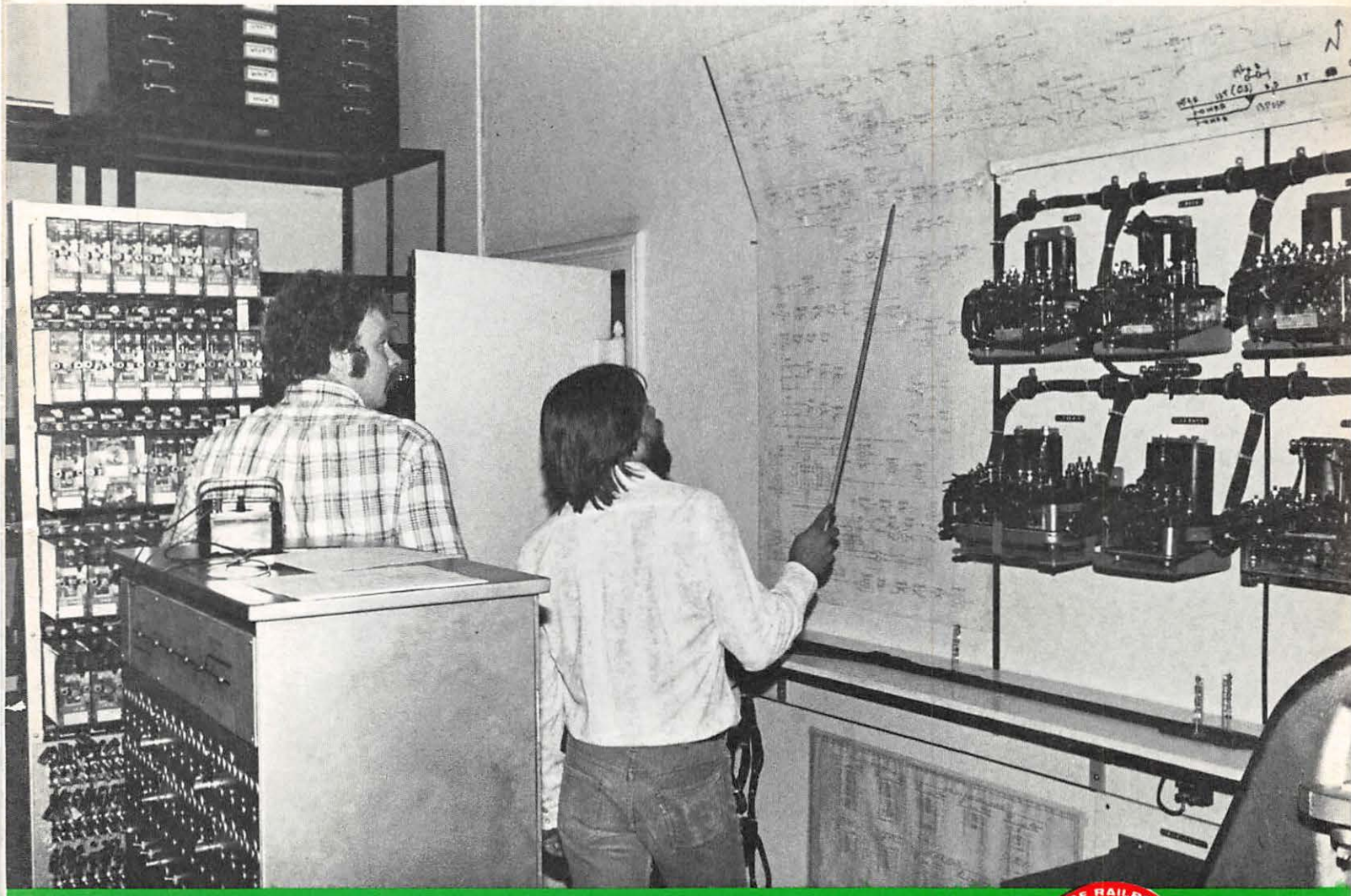
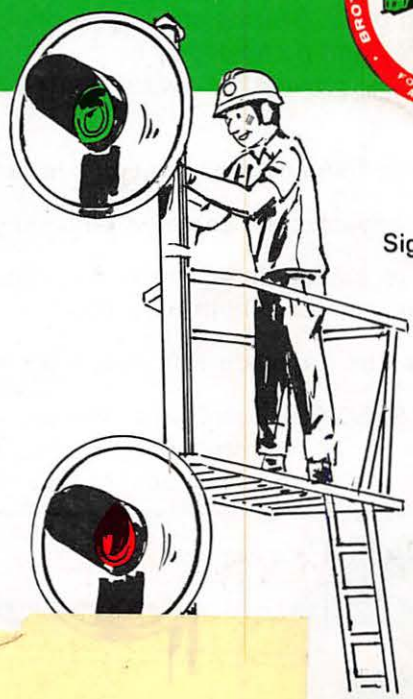


The SIGNALMAN'S Journal



Signalman Sam

Over 500 trainees have been through the Burlington Northern's signal training program. Chuck Van Belle (left), Local 188 and Bill Dowdell, Local 154, discuss ctc circuits in the school's "on-hands" laboratory in St. Paul, MN.

SEPTEMBER 1978

P F RHOADS 26
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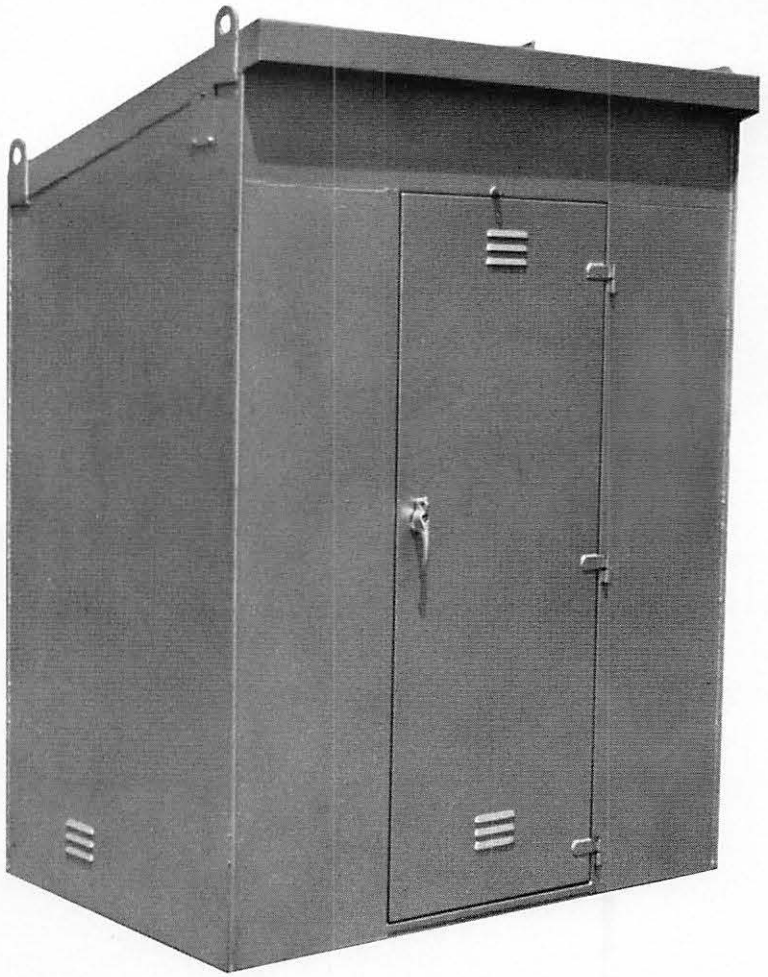
NEW INSTRUMENT SHELTER



Safetran's new Instrument Shelter is a *low cost* housing designed for Highway Crossing Signal and Wayside Signal Installations. This new shelter protects both man and equipment from rain and snow.

It is 52″ wide, 72″ long, 90″ high and is made of heavy gauge steel or aluminum and is easily installed on foundation piers. Four hoisting eyes, one on each corner, provides easy handling. The steel housing is prime coated and painted gray inside and aluminum outside. Permanently installed keyhole channels inside the shelter provide for a wide choice of shelving with wire chase, plug-in relay racks, backboards and battery trays.

Vent fan with thermostat that mounts in aerial cable knockout is available.

Aerial and underground cable entrance knockouts are furnished as specified for layout.

One door is standard, however an additional door can be provided for access to the rear of terminal board and/or plug-in relay rack.

Housing can be furnished with 1/2″ thick insulation.

TO ORDER SPECIFY: Instrument Shelter, Aluminum Part #540310, Instrument Shelter, Steel Part #560312 and specify accessories desired.

Safetran Systems Corporation
7721 National Turnpike • Louisville, KY 40214 • (502) 361-1691

Volume 59 Number 7 September 1978

ROBERT W. McKNIGHT
Editor & Manager
601 West Golf Road
Mount Prospect, Illinois 60056
312-439-3732

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News

DT&I and ConRail plan for remote control

Detroit, Toledo & Ironton and Consolidated Rail Corp. have applied to the Federal Railroad Administration for permission to install a remote control interlocking at Maitland, OH. Work will include installation of power operated switches and a connection for DT&I to ConRail track. The plant will replace a mechanical interlocking. The new facility will be remotely controlled from Cincinnati, OH.

B&O receives FRA approval to install traffic control

Baltimore & Ohio has received approval from the Federal Railroad Administration to install centralized traffic control on 19 miles of line between Hays and Gilkeson, PA. CTC will replace automatic block signaling arranged for current of traffic operation.

ConRail plans for about 79 miles of ctc

Consolidated Rail Corp., in three applications to the Federal Railroad Administration, is seeking permission to install centralized traffic control on about 79 miles of line. On 65 miles of line between Orrville and Crestline, OH, it is proposed to install ctc to replace existing automatic block signaling. Included will be the control of 12 interlockings. On 9 miles of line between Glen Echo and Cold Springs, OH, a manual block signal system will be replaced with a traffic control system for bi-directional operation. On 5 miles of line between Crestline and Galion, OH, existing automatic block signaling arranged for current of traffic operation will be replaced with a traffic control system.

SAVE
Signal
Training
Bulletin
(center of this issue)

ConRail gets FRA approval to install traffic control

Consolidated Rail Corp. has received approval from the Federal Railroad Administration to install a traffic control system between Indianapolis and Terre Haute, IN. Specifically, ctc will be installed on track No. 1 for about 54 miles between Gale and Preston, IN and on 56 miles between AN interlocking (Indianapolis) and Preston on track No. 2. The ctc replaces single direction automatic block signaling in service on tracks 1 and 2.

Missouri Pacific orders GRS traffic control

General Railway Signal has been awarded two contracts totaling $1.5 million to install centralized traffic control systems on two divisions of the Missouri Pacific.

The systems, for mainline territories between Roper, KS, and Ft. Gibson, OK, and Addis and Taft, LA, will feature coded transmission systems for sending switch and signal change commands to remote locations and change indications back to the Houston and Kansas City control centers. Other equipment to be furnished includes electric switch machines, wayside signals, and wired equipment housings.

Signalmen Wanted

Signalmen's positions on the Atchison, Topeka & Santa Fe Railway are available in Arizona, California and New Mexico. If interested please contact Paul C. Qualls, Employment Supervisor, Santa Fe Railway, 80 East Jackson Boulevard, Chicago, IL 60604.

An Equal Opportunity Employer

ConRail orders equipment for new yard controls

A computer-controlled, fully automatic car classification system will be installed at ConRail's DeWitt yard, near Syracuse, NY. The original 1928 GRS control system at the 40-class track yard will be replaced with modernized computer controls, also supplied by General Railway System Co. at a cost of about $1 million.

Milwaukee Road to install GRS ctc on its north line

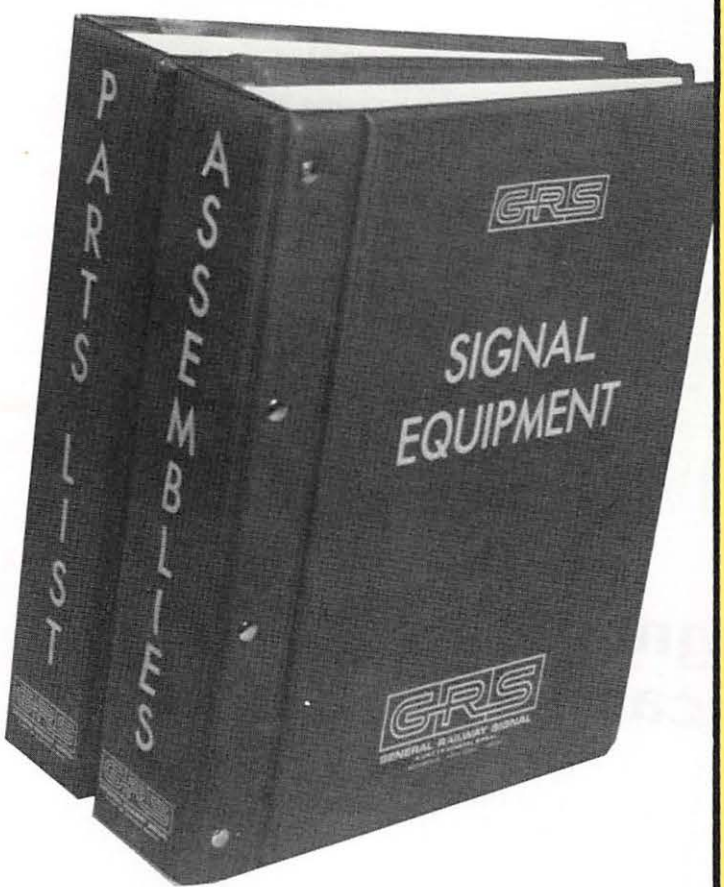
Funded by the North Suburban Mass Transit District, the Milwaukee Road will install a computerized ctc system on 43 miles of north commuter line between Chicago and Fox Lake, IL. The control center at Galewood will have a General Railway Signal Traffic Master control console with video display units and associated microcomputers. Cost is estimated to be about $1 million.

Rock Island agrees to sell line to SP

An agreement in principle has been reached between the Rock Island and the Southern Pacific in which RI will sell its line from Santa Rosa, NM to St. Louis, MO via Kansas City. Mileage includes 660 from Santa Rosa to Kansas City and 300 from there to St. Louis. SP would pay $57 million in cash for the line following approvals by the Interstate Commerce Commission and Rock Island's reorganization Court in Chicago.

GRS

The One Name To Remember For All Your Signaling Needs



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GRS

GENERAL RAILWAY SIGNAL
A UNIT OF GENERAL SIGNAL
ROCHESTER NEW YORK 14602

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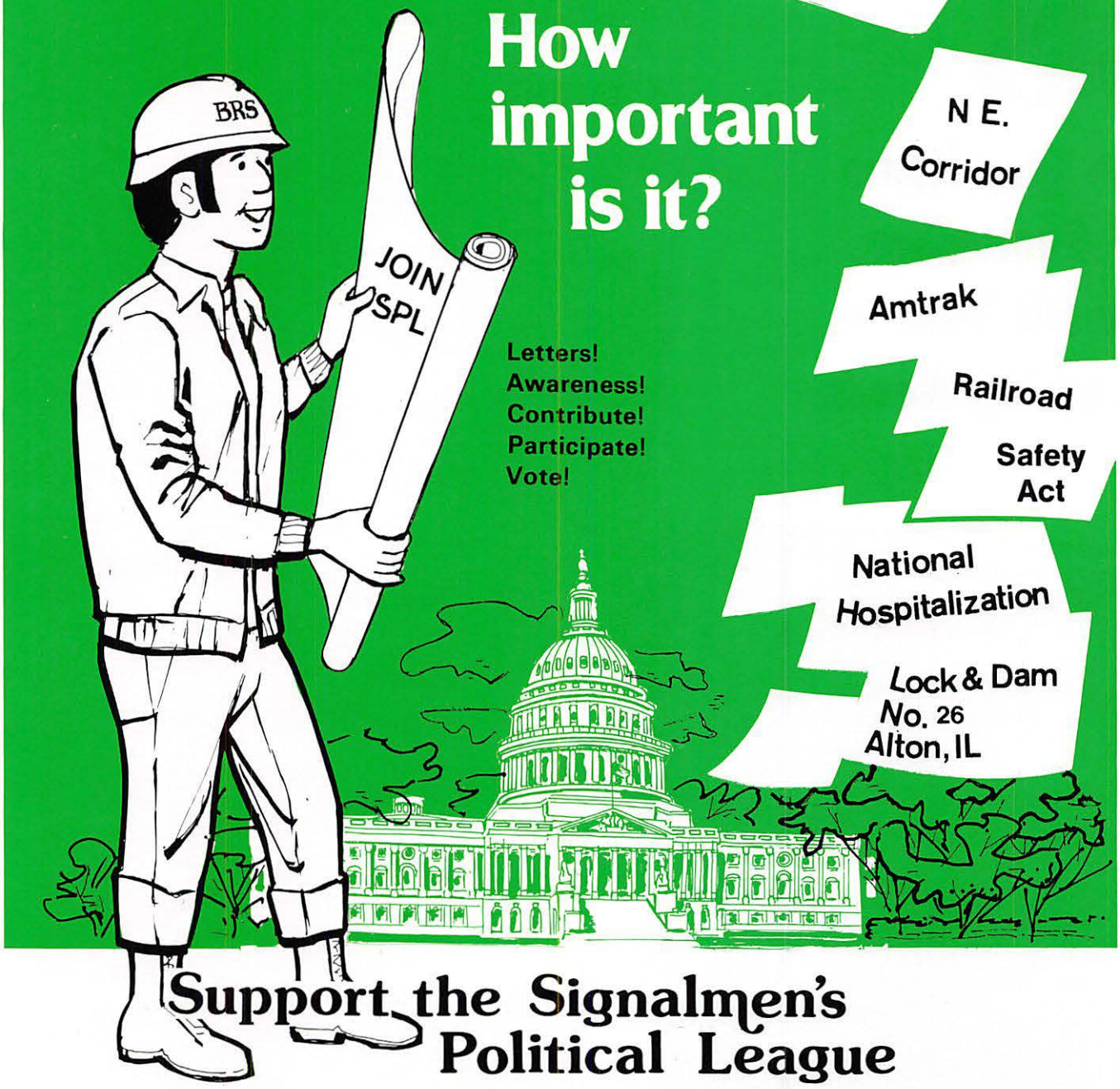
Political Strategy

How important is it?



Support the Signalmen's Political League

To: W. D. Best., Treasurer, **Signalmen's Political League, 601 W. Golf Rd., Mt. Prospect, IL 60056.** Here is $2 or more to help SPL carry out its campaign for good government. (Please make check or money order payable to Signalmen's Political League.)

_____ **Active Member** _____ **Retired Member**

Name _____ **Certificate No.** _____

Address _____

City _____ **State** _____ **Zip Code** _____

A copy of our report is filed with the Federal Election Commission and is available for purchase from the Federal Election Commission, Washington, DC 20463.

In this election year, our members—by their vote and membership in SPL—can help elect Congressmen who favor legislation that helps our BofRS Family. Signalman Sam says: "Make your plans now to join the Signalmen's Political League. For $2, every member of our BofRS Family can be a part of this worthwhile effort."

The no-contest battery.

Important questions you should ask about the cost, service life and performance of McGraw-Edison nickel-cadmium storage batteries.

What is the life expectancy of a McGraw-Edison nickel-cadmium battery?

Depending on the application, up to forty years.

How well do nickel-cadmium batteries stand up to cold weather?

Exceptionally well! Nickel-cadmium batteries are not subject to bursting from exposure to sub-zero temperatures, regardless of state of charge.

And tests prove that the nickel-cadmium battery will perform in the most frigid conditions.

What about hot weather?

Nickel-cadmium cells can be exposed to an average temperature of 115 F without significant loss of expected service life.

Do nickel-cadmium batteries retain a charge for long periods?

Yes. The nickel-cadmium battery shows remarkably little self discharge, even after standing idle for long periods of time.

A charged or discharged nickel-cadmium battery can be stored indefinitely without permanent damage.

But do they gas on discharge?

No.

Are nickel-cadmium batteries harmed by shorting or reversing?

No. A nickel-cadmium cell exposed to a short circuit is not harmed internally. Nor will it lose capacity when reverse voltage is applied.

What about mechanical characteristics?

Our plastic case eliminates the possibility of grounds and electrolytic corrosion of the cell. The transparent plastic also permits visual checking of electrolyte levels. The lighter overall weight of McGraw-Edison cells means easy handling and low shipping charges.

Do nickel-cadmium batteries have low internal resistance?

Yes. A high-rate discharge can be obtained from a relatively small ampere-hour capacity nickel-cadmium battery.

How much maintenance do nickel-cadmium batteries require?

Nickel-cadmium batteries require no periodic equalizing charges. With proper charging regulation, they need water additions as infrequently as once every few years.

What about corrosive fumes?

Nickel-cadmium batteries do not give off corrosive fumes that impair delicate electronic equipment.

Compare!

McGraw-Edison nickel-cadmium batteries are long lasting, require little maintenance and perform under the worst temperature conditions. Compare these features with those of your present batteries.

McGraw-Edison makes batteries for all railway and communications services. Our nickel-cadmium batteries and battery chargers meet the power requirements of any installation. Batteries: six types with capacities from 80 to 400 ampere hours.

Chargers: Nine models with outputs from 1.5 to 40 amps.

Edison batteries and chargers are products of McGraw-Edison Company, Power Systems Division P.O. Box 28, Bloomfield, NJ 07003.

McGRAW-EDISON

The no-contest battery.

Signalman's Store

ORDER FORM

Please send me the following:

Item		Quantity Ordered	Price Each	Total $
Cloth Emblems			$1.50	
Coasters:	black and gold		.20	
	red and green		.25	
Playing Card Decks			3.00	
Golf Caps:	__ Red __ Bk __ Wh __ Sm __ M __ Lg		4.50	
Signalman's Training Course	8-Volume Set		18.00	
	Volume 1		2.50	
	Volume 2		2.50	
	Volume 3		2.50	
	Volume 4		2.50	
	Volume 5		2.50	
	Volume 6		2.50	
	Volume 7		2.50	
	Volume 8		2.50	
Decals:	3-inch		.15	
	4-inch		.15	
Lapel Pin:	colorlight signal		1.50	
	BofRS		2.00	
Windbreakers	Small		12.00	
	Medium		12.00	
	Large		12.00	
History of the BofRS			9.95	
Master Nat'l. Agreement Bk.			7.95	
General Chairman and Local Chairman's Manual			3.00	
TOTAL AMOUNT ENCLOSED				

Minimum order accepted is $5.00

Make check or money order payable to:
BROTHERHOOD OF RAILROAD SIGNALMEN

Send payment and order to:
BROTHERHOOD OF RAILROAD SIGNALMEN
601 West Golf Road
Mount Prospect, Illinois 60056

NAME _____

LOCAL NO. _____

ADDRESS _____

CITY _____

STATE (PROVINCE) _____

ZIP CODE _____

CLOTH EMBLEM with BofRS in white letters on red border, two locomotives, and green over red searchlight signal.

COASTERS with BofRS emblem come in black and gold or in red, white and green; 3-inch diameter.

PLAYING CARDS with BofRS emblem are now available. These high quality cards come in the conventional bridge decks, including jokers. Cards and emblems are in color.

GOLF CAPS with BofRS in color are available in small, medium or large with adjustable head band. These lightweight net caps come in red, black or white.

The eight-volume **SIGNALMAN'S TRAINING COURSE** covers the following subjects:

1. Electricity, circuit symbols and nomenclature
2. Signal symbols and nomenclature
3. Automatic block signaling, time code control, electronics
4. Traffic control systems and power switch machines
5. Highway grade crossing warning systems, FRA RS&I tests
6. Remote control and automatic interlockings
7. Ctc machines and their operation
8. Maintenance of signal equipment

SIGNALMEN'S DECAL has adhesive backing so it can be applied to glass, leather, metal, etc. for BofRS identification on car windows, bumpers, luggage, hard hats, etc. The emblem is 4-inches or 3-inches in diameter. It has a red border with white letters. The signal displays green over red.

Metal **COLORLIGHT SIGNAL LAPEL PIN** 1/2-inch in diameter with signal showing green over yellow over red on white enamel background. Signal and pin outlined in gold.

BofRS **LAPEL PIN** identical to decal except letters and outline are in gold.

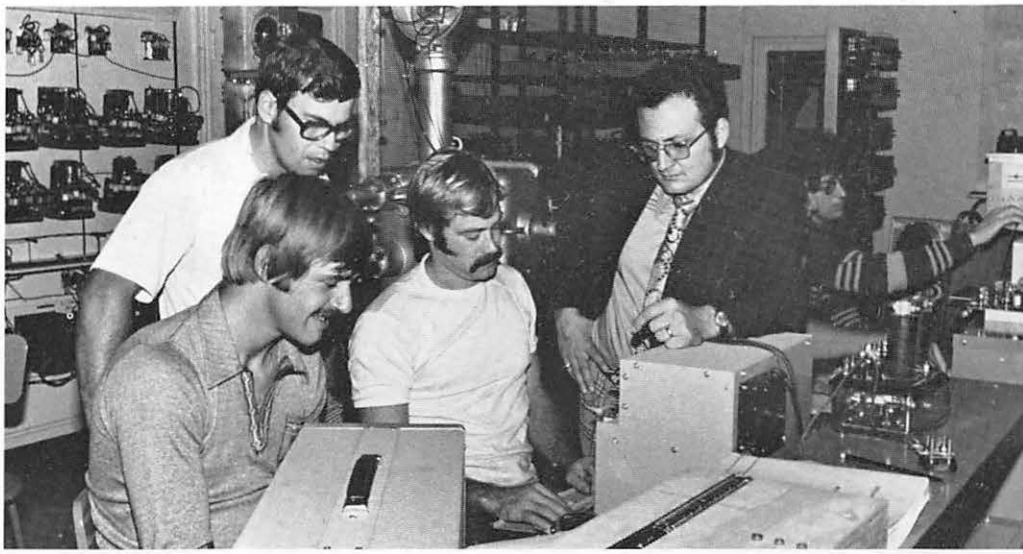
Red nylon **WINDBREAKERS** with elastic sleeve ends that fit tight to the wrists and with a drawstring at the bottom to pull tight to the waist come in three sizes: small (36-38); medium (40-42); and large (44-46). Two slash pockets and a cloth BofRS patch on the left front complete these men's jackets. The windbreaker is machine or hand washable in warm water.

A **HISTORY OF THE BROTHERHOOD OF RAILROAD SIGNALMEN** has been written by the late A. E. Lyon, president emeritus, which covers the 75 years of the Brotherhood since its founding in 1901.

MASTER NATIONAL AGREEMENT BOOK has the basic provisions of national agreements negotiated with U.S. railroads and the BofRS. They are contained in a loose-leaf binder with 2-inch rings so there is room for additional material, such as local agreements. The 23 sections are:

A Summary of wage changes
B Summary of other benefits
C Washington job protection agreement of 1936
D Vacations
E Union shop agreement
F Holidays
G Claim and grievance handling
H Health and welfare
I Force reductions
J Employment security
K Travel time and away-from-home expenses
L Off-track vehicle accidents
M Jury duty
Mc Current agreement
N Overtime
O Camp cars
P Apprentice programs
Q Change of residence
R Earnings deduction in discipline cases
S Supplemental sickness benefits
T Union dues checkoff
U Amtrak C-1, C-2
V Seniority modification agreement

BN signal school works



Robert L. Schmidt (right) manager of signal training, explains motion sensor operation to Richard D. Harms (left) local 119; Patrick P. Snipes (center) local 119; and Gary W. Bushmeyer, local 103.

Marshall Casler (left) supervisor signal training; Paul W. Clanin (center) local 103; and Dennis R. Neumann (in local 154 and since promoted to a supervisory position) observe a digital motion detector in operation.

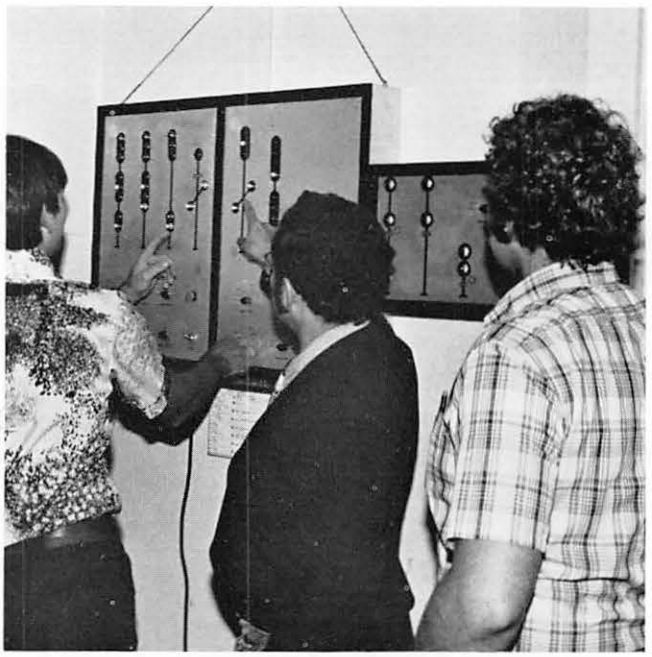
Burlington Northern's signal training program is in its fifth year. Over 500 trainees are or have been in the 3-year program, of which over 100 have graduated. For all new employees, the program consists of formal classroom instruction, a laboratory for "on-hands" practical work with signal equipment, home study and on-the-job training.

Introduction to the training program begins when the new employee is hired. He is given two BN signal training manuals: (1) provides an overall view of the training program including a curriculum outline, assignment guides, schedules of classroom work and objectives to achieve training goals. (2) Volume 1- Signals general has information about the Burlington Northern, a brief history of signaling, and information on basic electricity, meters and energy distribution. The new employee is required to read and study these two manuals during his first six months of employment.

These first six months are crucial in that the employee has the opportunity to read and learn about the railroad, and specifically about signal work. He has the time to realize what his opportunities are for advancement and to determine his capabilities for signal work. These two training manuals are invaluable in providing an excellent view for the trainee of what he can expect of his employment in the signal department. Although a few new employees have dropped out in the first six months, most of the men have stayed. Those who stayed have given much credit to these introductory training manuals and the fact that the manuals are given to the men when they are hired.

After a maximum of six months employment, the new employee attends his first week of classroom training. Six 1-week classroom sessions will follow at about 6-month intervals, for the next 3 years. In the 6 months between classroom sessions, trainees are required to complete home study assignments that prepare them for the classroom instruction as well as expand their knowledge of signaling.

"Each classroom session is de-



Model board on classroom wall shows the various signal apects used on the Burlington Northern. Students are able to identify signals on this board with those they see in the field during their regular work.

Laboratory section has actual working signal equipment, such as crossing gate mechanism, relays associated with automatic block signaling (back wall) and searchlight dwarf signal.

signed primarily to elaborate and highlight the prescribed home study reading and written assignments that are given between each session," says Robert L. Schmidt, manager of signal and communications training.

A qualification examination is given to each trainee on Friday of each week. Trainees must pass the examination with a grade of 70% or greater to retain employment in BN's signal engineering section. The examination, as well as the training program resulted from an agreement between the BN and the Brotherhood of Railroad Signalmen (agreement printed elsewhere in this article). Upon passing each qualification examination, the trainee is advanced to the next training period, and his pay raised according to a schedule. A trainee is provided one re-examination within 30 days if he fails the qualification examination. Failure to pass on the re-examination will cause the trainee to forfeit all his seniority rights and be considered as having resigned from the railroad.

The seven weeks of classroom instruction are as follows:

Week 1 is basically orientation in which the trainee is told about his responsibilities. Organization of the Burlington Northern is described including the part played by the signal department and how signaling provides for the safe and efficient movement of trains. Other subjects covered in week 1 include:

—Basic concepts of electricity, mathematics and physics and their role in signaling.

—Direct current track circuit and the key role of fail-safe principles in railway signaling.

—Function of railway associations such as the Communication & Signal Section, Association of American Railroads.

—Signal manufacturers and suppliers, their addresses and the equipment they supply for the signaling field.

—Vocabulary of signaling, including technical terms and their meanings.

—Basic relay theory of operation.

—What signal equipment is used by the Burlington Northern, and from a conceptual standpoint, how the equipment functions.

Trainees spend about 15 hours in the laboratory during the first week to see signal equipment, some of it operating, and to learn the use of the basic meter—the volt-ohm-millimeter.

Week 2 covers the dc track circuit in detail including trouble shooting. Energy distribution is studied including conversion of high voltage, alternating current commercial power to low voltage direct current for the operation of signal equip-

ment. AC and dc theory are also taught, because they are basic to the understanding of signal equipment operation. About 15 hours are spent in the laboratory working with track circuits—setting them up, placing in proper operation and trouble shooting to find and correct failures.

Various electrical laws such as Ohm's and Kirchoff's are demonstrated and confirmed in laboratory work.

Week 3 advances the trainee's knowledge of signaling, covering these topics:

—Automatic block signal system.
—Basic relay logic circuits.
—Pole line configurations.
—Federal Railroad Administration signal rules, standards and instructions as related to ABS.
—Various signal mechanism functions are described and demonstrated.

About 20 hours are devoted to laboratory work including trouble shooting on a 3-block, 4-aspect automatic block signal system. Various types of circuits are wired by the trainees including loss of shunt, stick, switch circuit controller, and electric switch lock used in an ABS system. Proper maintenance techniques are also explained.

Week 4 covers railroad-highway grade crossing warning systems with about equal time devoted to classroom work and laboratory work (20 hours each). Basic circuits and philosophies of crossing warning systems are explained including motion responsive equipment, audio frequency track circuits, constant warning time devices, etc. Trainees are told the part played by state regulatory agencies in setting operating parameters. Maintenance techniques are described and demonstrated. The laboratory portion provides trainees the opportunity to observe crossing warning devices at work. They learn to wire the various types of circuits used in these systems. Also stressed is the importance of trouble shooting to find defects and correct them.

Week 5 is devoted to centralized traffic control systems and equipment. FRA signal rules concerning ctc are explained. The various technologies and circuits are explained with emphasis placed on safety circuitry in the field or vital circuits. Also included in the study are control machines, coding techniques and other control apparatus as a communication medium between the control office and field stations. About equal time is spent in classroom and laboratory work. Trouble shooting and wiring circuits and apparatus (switch machines, electric locks, locking circuits, etc.) used in ctc systems comprise the lab work.

Week 6 is spent on interlockings and retarder classification yards. Test and inspection forms furnished by the railroad but requiring information to meet FRA rules, standards and instructions, are explained to the trainees and they are told how to make the tests and fill out the forms. The basic steps involved in freight car classification in an automatic hump yard are explained from a conceptual standpoint. Additional ac theory and electronic theory are introduced and explained. Use of the oscilloscopes other electronic test equipment, AFO truck circuits, etc., automatic interlocking are covered in the Week 6 session in the laboratory, which takes about half of the time.

Week 7 is devoted to ac theory as needed to cope with electronic equipment used in signaling. AC theory was introduced in the first week and is expanded on in each of the following classroom and laboratory sessions to provide the trainee with the understanding necessary for operation of hotbox detectors, audio frequency track circuits, motion sensors, grade crossing warning devices and various carrier equipment used in signal systems. Use and operation of basic test equipment including oscilloscopes, frequency selective voltmeters, etc., are taught so the trainee can maintain and make field adjustments to electronic signal equipment. The trainee graduates from the signal training program after successfully passing the qualification test at the

Bob Schmidt (left, kneeling) signal training manager, explains operation of automatic block signal system to Charles M. Van Belle (center) local 188; and William D. Dowdell (right) local 154.

Bob Schmidt answers a question about the motion detector for John N. Unze (left, formerly of local 154, since promoted to a supervisory position).

At a graduation dinner for trainees, Burlington Northern general chairman William A. Class, Jr., congratulated the men on the successful completion of the signal training progam and wished them success on the job.

Signalmen Graduate

W. W. Lauer, BofRS grand lodge representative, said that the graduates could have pride in being signalmen and in taking on responsibility.

Robert F. Richardson, assistant general chairman and general secretary-treasurer, BN, commended the men for their hard work and dedication.

C. H. Dunn, director of signal engineering for BN at the time of this graduation, said that a good caliber of men were graduating from the school. He congratulated them on their fine achievement.

M. B. Walker, assistant director of signal engineering, BN, asked the graduates to share their knowledge with others of how signals work.

Keith Sletten, director of personnel development, congratulated the men on their graduation.

Bill Pearson, retired engineer signal construction, BN, told the graduates that their learning is just beginning.

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About 20 hours are devoted to laboratory work including trouble shooting on a 3-block, 4-aspect automatic block signal system. Various types of circuits are wired by the trainees including loss of shunt, stick, switch circuit controller, and electric switch lock used in an ABS system. Proper maintenance techniques are also explained.

Week 4 covers railroad-highway grade crossing warning systems with about equal time devoted to classroom work and laboratory work (20 hours each). Basic circuits and philosophies of crossing warning systems are explained including motion responsive equipment, audio frequency track circuits, constant warning time devices, etc. Trainees are told the part played by state regulatory agencies in setting operating parameters. Maintenance techniques are described and demonstrated. The laboratory portion provides trainees the opportunity to observe crossing warning devices at work. They learn to wire the various types of circuits used in these systems. Also stressed is the importance of trouble shooting to find defects and correct them.

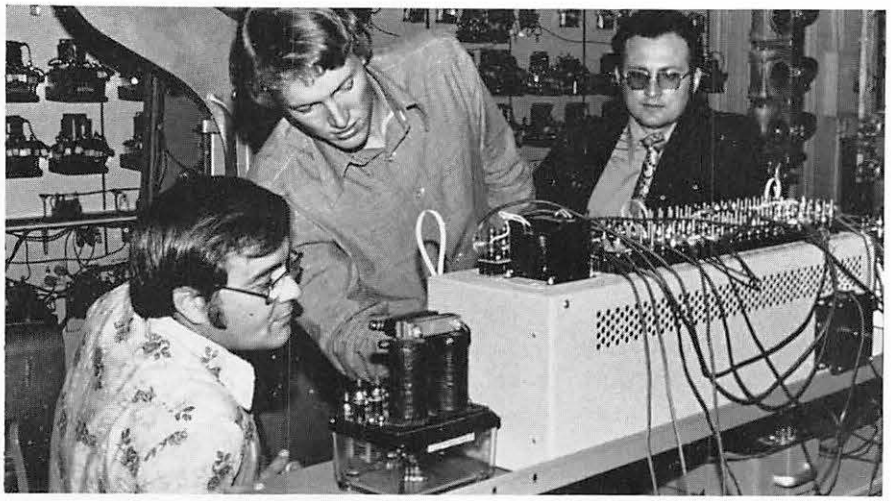
Week 5 is devoted to centralized traffic control systems and equipment. FRA signal rules concerning ctc are explained. The various technologies and circuits are explained with emphasis placed on safety circuitry in the field or vital circuits. Also included in the study are control machines, coding techniques and other control apparatus as a communication medium between the control office and field stations. About equal time is spent in classroom and laboratory work. Trouble shooting and wiring circuits and apparatus (switch machines, electric locks, locking circuits, etc.) used in ctc systems comprise the lab work.

Week 6 is spent on interlockings and retarder classification yards. Test and inspection forms furnished by the railroad but requiring information to meet FRA rules, standards and instructions, are explained to the trainees and they are told how to make the tests and fill out the forms. The basic steps involved in freight car classification in an automatic hump yard are explained from a conceptual standpoint. Additional ac theory and electronic theory are introduced and explained. Use of the oscilloscopes other electronic test equipment, AFO truck circuits, etc., automatic interlocking are covered in the Week 6 session in the laboratory, which takes about half of the time.

Week 7 is devoted to ac theory as needed to cope with electronic equipment used in signaling. AC theory was introduced in the first week and is expanded on in each of the following classroom and laboratory sessions to provide the trainee with the understanding necessary for operation of hotbox detectors, audio frequency track circuits, motion sensors, grade crossing warning devices and various carrier equipment used in signal systems. Use and operation of basic test equipment including oscilloscopes, frequency selective voltmeters, etc., are taught so the trainee can maintain and make field adjustments to electronic signal equipment. The trainee graduates from the signal training program after successfully passing the qualification test at the

Bob Schmidt (left, kneeling) signal training manager, explains operation of automatic block signal system to Charles M. Van Belle (center) local 188; and William D. Dowdell (right) local 154.

Bob Schmidt answers a question about the motion detector for John N. Unze (left, formerly of local 154, since promoted to a supervisory position).



Harry J. Harwick (left) local 154, and Leo Yudsky (center) local 87, set up rail-highway grade crossing controls under the guidance of Robert L. Schmidt, manager signal and communications training.

end of this seventh week.

While the above outlines the material covered in classroom and laboratory sessions, the signal training program emphasizes the use of home study material and on-the-job training during the six months between classroom and laboratory sessions. Each classroom session and laboratory session is designed to highlight the prescribed home study reading and written assignments that are given during each six month training period.

BN uses the following training manuals:

—BN signal training program manual has curriculum outline, reading assignments and other pro-

Brotherhood of Railroad Signalmen has a signal training agreement with the

RULE 30. TRAINING PROGRAM

A. Assistant Signalmen and Assistant Signal Maintainers shall be eligible for participation in the training program established by this rule after six (6) months' service in the Signal Department and will be required to participate in the training program, both classroom and home work portions thereof. In the event training requirements exceed the available number of men with six (6) months' service, the Carrier may temporarily reduce or waive the six (6) months' elegibility period.

B. Employees shall be required to serve six (6) periods of 130 eight (8) hour days of service each, overtime excluded, before being considered eligible for promotion to Class 4, except as hereinafter provided in this rule.

C. The following rates of pay shall apply for Assistants in training:

1st training period — 1st step
2nd training period — 3rd step
3rd training period — 4th step
4th training period — 6th step
5th training period — 7th step
6th training period — 8th step

D. Employees entering service as probationary Assistants will be required to sign a statement to the effect that they fully understand they will be required to pass progressive examinations for each of the six (6) 130 eight (8) hour day periods of training before progressing to the next period or to a higher class.

E. The classroom portion of the training program will consist of at least six (6) sessions, each session one (1) week, Monday through Friday, in length with a minimum of thirty-five (35) days of classroom sessions during the training program. The number of sessions and their length may be changed at the discretion of the Carrier, however, at no time will more than two (2) sessions be held consecutively unless agreed to by the General Chairman.

F. Where it becomes necessary to schedule sessions on two consecutive weeks, students who elect to remain at the training point during the intervening weekend will be provided meals and suitable lodging facilities by the Carrier.

G. If the classroom instructions are scheduled for two (2) consecutive weeks and the Carrier agrees, at the option of the majority of the members of the class, the instruction may continue on Saturday and Sunday of the intervening weekend, in which case the class members will receive their rest days on Thursday, Friday, Saturday and Sunday of the second week.

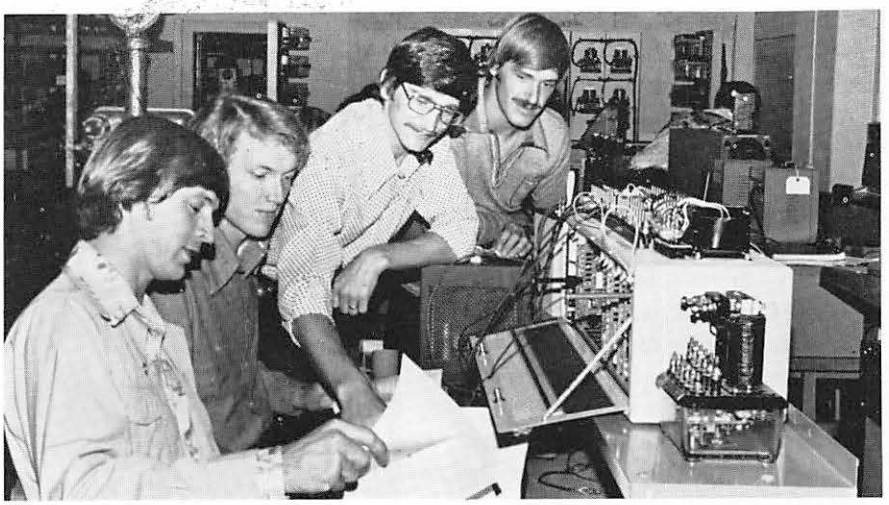
H. Initial classroom course will be given as soon as practicable after employment and

gram information.

—BN signal training manual Volume I—Signals, general covers the railway system, history of signaling, basic electricity, batteries, meters, energy distribution and trouble shooting.

—BN signal training manual Volume II—signal devices covers dc relay, track appliances, light signal, crossing bell, gate mechanism, switch circuit controller, spring switch mechanism, power operated switch machines and electric switch lock.

—BN signal training manual Volume III—signal circuits and systems covers signal and track circuits, automatic block signaling, high-



From the left are: Michael A. Tesch, local 154; Leo Yudysky, local 87; Marshall Casler, asst. mgr. signal training; and Richard D. Harms, local 119. They are setting up the controls for a Grade Crossing Predictor unit.

Burlington Northern (Rules 30 and 31) effective September 1, 1972

subsequent classroom courses will be scheduled as nearly as practicable so that there will be an equal period between courses, so that employees will have an opportunity to progress from one training period to another. Classroom instruction shall be held at such points as may be designated by the Carrier. Uniform, written, progressive examinations based on the course will be required. Examinations will be based on course training material and/or material presented in class by the instructor. A grade of seventy percent (70%) or better shall be considered a passing grade. If an employee successfullly passes the examination he will be advanced to the next following training period at the expiration of that particular training period. In the event of failure to pass any examination, re-examination shall be given within thirty (30) days from date of such failure, on the entire examination which he previously failed. He shall be graded on the entire re-examination, using the same grade factor as used in the previous examination which he failed.

I. Failure of any employee to take and pass re-examination will result in such employee's forfeiture of all seniority and rights and such employee will be considered as having resigned from the Carrier's service. This paragraph shall not apply to merger protected employees.

J. An employee subject to the provisions of this training program who leaves the service of the Carrier before completion of the sixth period of training and is subsequently reemployed, will be required to take and pass examinations not yet taken on the basis set forth in paragraph H of this rule.

K. Should the need arise for more employees in Class 4 than are available by the graduation of employees from the sixth period, then the senior of those employees going through the training program shall be given preference for promotion. In the event an employee so promoted fails to meet the requirements of the position within thirty (30) working days, he shall be restored to position in Class 5 and paid the rate consistent with his training period and examinations passed. If the Carrier asserts that an employee promoted prior to completion of his training has failed to meet the requirement of the position within the thirty (30) day period referred to above, he shall be given a written and practical examination agreed to by the Director-Signal Engineering and General Chairman, on the requirements of the position in question. Such examination shall be divided into points for each written question or practical test and a grade of seventy percent (70%) shall be considered as passing. Such examination shall be administered by the Director-Signal Engineering and General Chairman or their designated representatives. An

way-railroad grade crossing warning systems, centralized trafffic control, interlockings, hotbox detectors and overlay track circuits.

—BN signal training manual—programmed learning in two volumes on basic electricity includes meter usage and trouble shooting.

—BN signal training manual —programmed learning in two volumes covering mathematics from arithmetic through equations to Ohm's law problem solving.

Reading assignments are given to trainees to study these manuals between classroom and laboratory sessions. For example, a trainee has this reading assignment to be completed in the six-month period before at-

Classroom has three tv monitors for playing of video-taped lessons. Schmidt (at front) can give individual instruction while rest of class watches tv monitors.

BofRS-BN Signal Training Agreement (continued)

employee promoted to Class 4 under this paragraph before having completed the required six (6) examination shall be required to take and pass such remaining examinations on the same basis as if he were still an Assistant, and in the event of his failure to pass a re-examination he will forfeit all seniority and rights and such employee will be considered as having resigned from the Carrier's service.

L. Employees will be furnished the appropriate training material at the beginning of each period of training to enable them to prepare for examination for each period of training.

M. Examinations provided for in this rule shall be fair and impartial and employees taking these examinations will not be examined on matters with which they have not had an opportunity to become familiar either through the study of training manuals applicable to their status of training or training which has been afforded them.

N. An Assistant retained in the service following the probationary period will be paid in accordance with his previous experience in signal work on this and other railroads, as provided in Rule 45. However, such an employee will be in the same status with respect to training as any other new Assistant in the application of the training program under this rule.

O. Upon the completion of six (6) periods of 130 eight (8)-hour days of service each as an Assistant, or upon successfully passing the examinations as provided in paragraph D, an employee must bid for and accept promotion to a position in Class 4 if a vacancy or new position is open. If no position is open, such Assistant will continue at the highest Assistant's rate until it is possible to promote him. If there are two (2) or more Assistants who have completed their training as provided herein, they will be promoted in seniority order. An employee who refuses promotion as provided herein shall forfeit all seniority and rights and will be considered as having resigned from the Carrier's service.

P. All Helpers and Assistants now in the service in the third step or below at the time the training program begins will be required to enter the training program herein and comply with its provisions. New employees entering the service may be hired as Assistants but not as Helpers. Rates of pay for which they may have previously qualified and been receiving will, however, not be reduced as a result of this provision.

Q. When an employee is notified to attend a training class, he will be notified the form of transportation to be used in going to and from the point where classes are held, as follows:

(1) If an employee is authorized to use com-

Marshal Casler (left) asst. mgr. signal training, goes over lesson plans with Robert L. Schmidt, manager signal and communications training.

tending Week 4 which is devoted to rail-highway grade crossing warning systems.

—Review chapters in the signal device manual on direct current relay and track appliances.

—Review chapters in signal circuit manual on reading signal circuits and track circuits.

—Read, study and digest chapters on crossing bell and gate mechanism.

—Read, study and digest chapters on reading signal circuits, track circuits and crossing warning systems.

—Read, study and digest chapters on generators and dc motors in Navy Electricity Manual.

—Read chapters on electrical machines in Navy Electricity Manual and Army dc and ac theory books.

pany transportation, such transportation will be used.

(2) If commercial transportation is authorized, the employee will be reimbursed the cost thereof.

(3) If an employee is authorized to use his automobile, the approved automobile mileage allowance will be paid for going to and from the point where classes are held.

R. Employees while en route or attending a class will be allowed meal and lodging expense under the provisions of Rule 13.

S. Employees will not be compensated for time spent traveling to and from the point where the classes are held except during the hours of their assignment.

T. Employees will be compensated at their regular straight-time rate of pay while attending classes. Should one of the holidays specified in the Signalmen's Agreement occur during a classroom instruction period on a day which would normally be a workday for the employees, the majority of the group shall select an alternate date. The Carrier will to the extent possible schedule classes in weeks that do not include holidays.

U. Textbooks and other study material will be supplied by the Carrier at no cost to the employees except that the employees will sign receipts therefor acknowledging responsibility for payment for loss of or damage, excluding normal wear, to such training material during the course. Upon successful completion of the course, such materials will become the property of the employee. Employees who fail to complete the course must return all course material to the Carrier or make payment in lieu thereof.

RULE 31. TRAINING PROGRAM— PREPARATION FOR FCC LICENSE

A. A training program shall be established consisting of a course of study in the "Principles of Electricity and Electronics" to assist employees in preparing to undertake examination for a Federal Communications Commission Second Class Radio-Telephone Operator's License.

B. Employees may be permitted to pursue the training course upon written application to the Carrier, approval of such application to be based upon the employee's Performance Rating and the scores of General Knowledge and Mechanical Comprehension Tests and requirements of the Carrier.

C. Employees pursuing the training program must complete one section of the training course with a passing grade as stated below and within a period of time as prescribed by the Carrier. They will not be required to complete sections of the training course during vacation periods of two weeks or more or during leaves of absence of greater than two weeks. Each

In addition to BN signal training manuals, technical manuals, pamphlets and brochures are distributed to trainees as needed from the US Government, signal equipment manufacturers, BN signal and maintenance standards, Communication & Signal Section, AAR, American Railway Engineering Association, etc.

In the classroom and laboratory, various devices and techniques are used for imparting information to trainees. Some devices used are: chalk board, closed circuit television, overhead transparency projector, slide projector, movies, easels, and actual signal equipment in the laboratory and signal equipment simulators, as well as test instruments and meters. Some simulation units are used to provide trainees with experience in trouble shooting of track circuits, for example. The students also get practice in wiring and troubleshooting automatic block signal systems, highway crossing systems and centralized traffic control systems.

Class size is normally 10 to 15 trainees. BN pays for trainees' transportation to and from St. Paul, MN where the signal training school classroom and laboratory are located, plus housing and meals while in attendance at classes. Trainees are paid straight-time wages while in school.

"Our basic training goals are to improve overall maintenance and construction practices, improve employee morale and decrease employee turnover by explaining the necessary technical information to prepare the signal employee to cope with the complexities of his job—both from the preventative maintenance and the diagnosing of circuit and/or system malfunction standpoints. We also impress safety and the importance the Burlington Northern places on each signal employee successfully completing his assigned responsibilities. We also stress that life as we know it would not be possible without railroads and that these railroads are only as safe and efficient as their signal systems allow," says Schmidt.

The signal training staff, which now includes Assistant Manager Marshall S. Casler and Larry Mikelson as well as Schmidt, believes that in addition to their responsibilities to BN, they have the obligation to encourage each trainee to continuously reflect on the consequences of his actions, constantly consider that lives are at stake and that providing a premise for the safe and efficient movement of trains is indeed serious business.

As for the future, the BN is exploring the possibility of either developing or purchasing an electronic training program for its signal employees. Also, through the use of a studio, BN (and recently as a joint venture with Harmon Electronics and Safetran Systems Corp.) has made video tape recordings of most of the lessons in the present program. Expansion of this may include updating lessons on hotbox detectors, electronic track circuit units and other devices that could be sent into the field for playback through conventional tv sets strategically located where several signal maintainers or construction gangs are headquartered. "The potential versatility and flexibility of this medium for getting information out to the man in the field who needs it—where the action is—is mind boggling," says Schmidt.

BofRS-BN Signal Training Agreement (concluded)

section of the training course must be completed with a passing grade determined as having correctly answered seventy-five percent (75%) of the examination questions, before undertaking the subsequent section of the training course.

D. Copies of graded examinations will be returned to all employees pursuing the training course.

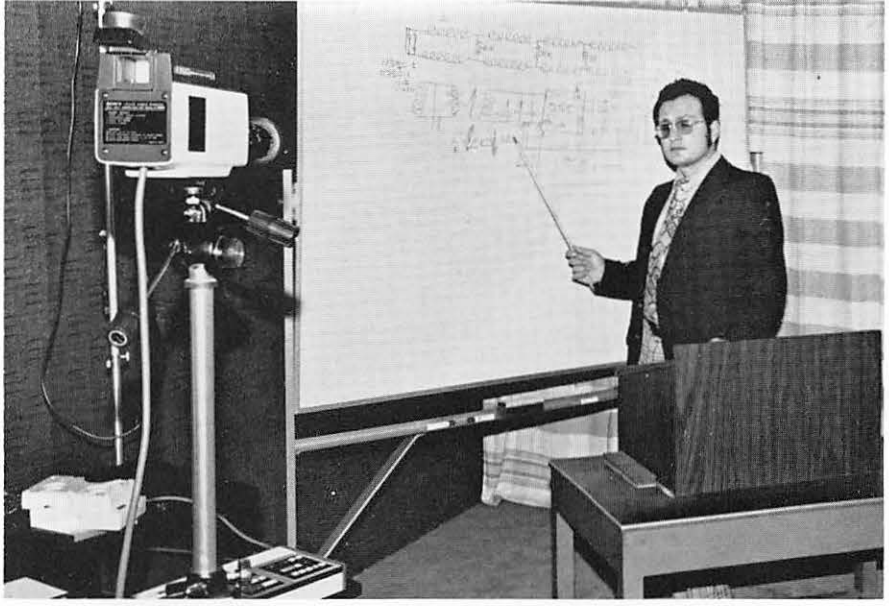
E. Employees who fail an examination of one of the sections of the training course will be afforded not more than two additional opportunities to pass such examination. Each re-examination must be completed and submitted within an interval of time equal to the period of time allowed for the regular study of the section of the course.

F. Employees who fail the second re-examination on a section of the training course shall be automatically disqualified from further pursuit of the training course.

G. Failure of an employee to take an examination on any part of the training course within the time limits prescribed for each section of the training course will be considered as having failed the examination unless prior approval is received from the Carrier.

H. Employees, once having commenced the training course, will be permitted to complete it, subject to their meeting the conditions set forth in this rule.

I. Employees will be reimbursed for time lost and their personal expenses incurred, including examination fee, in taking the Federal Communications Commission License Examination, with a limit of two (2) re-examinations per employee.



Studio at the BN signal training school is used to make video tape recordings for use in the classroom. Bob Schmidt, manager, signal training, records a lesson before the tv camera. Consideration is being given to making tv monitors available for field personnel with recorded lessons, such as covering updating of maintenance of hotbox detectors and new types of electronic signal equipment.

As of September 15, 1977, the administration of the BN Signal Training Program was transferred from the Signal Engineering Section to the Personnel Development Section of the Personnel Department. This began the movement toward consolidating training activities on the BN. Since then David F. Ylkanen, vice president, personnel and Keith B. Sletten, director personnel development, have actively supported this program. "Being able to share ideas, problems and equipment with others in the business of training on the one hand, while maintaining close liaison with M. M. Schultz, director of signal engineering, on the other, has greatly improved our program," says Schmidt.

Brotherhood of Railroad Signalmen and Burlington Northern honor graduates from the signal training program

(See next page, 18)

J. If there are no qualified applicants for a position requiring an FCC license, then the senior applicant who passes an appropriate Aptitude Test, or in the absence of any applicants the senior employee in Class 5 on the seniority district, will be assigned and required to pursue the training course.

K. Employees on a position requiring a 2nd Class FCC License must pursue the Training Course. Other employees may be permitted to pursue the Training Course upon written application as outlined in Paragraph B above.

L. Employees who fail the second re-examination on a section of the Training Course shall be automatically disqualified as shown in Paragraph F above. If such employee is on a position requiring a 2nd Class FCC License, he shall automatically become disqualifed from such a position and will exercise displacement rights as provided by Rule 29 on position other than that requiring a Second Class FCC License.

M. Employees who are disqualified through failure to obtain a passing grade in a section of the Training Course or who do not pass the Federal Examination may subsequently reinstate their right to take position requiring Second Class FCC License if they present evidence they possess a valid Federal Communications Commission License of a Second Class Radio Telephone Operator's grade or higher.

N. Employees who have successfully completed the Training Course but who fail to obtain a Federal Communications Commission Second Class Radio Telephone Operator's License within a period of six (6) months from the date of completing the Training Course shall be automatically disqualified from the position requiring the License and will exercise displacement rights as provided by Rule 29 on position other than that requiring a Second Class FCC License.

At a graduation dinner for trainees, Burlington Northern general chairman William A. Class, Jr., congratulated the men on the successful completion of the signal training progam and wished them success on the job.

Signalmen Graduate

W. W. Lauer, BofRS grand lodge representative, said that the graduates could have pride in being signalmen and in taking on responsibility.

Robert F. Richardson, assistant general chairman and general secretary-treasurer, BN, commended the men for their hard work and dedication.

C. H. Dunn, director of signal engineering for BN at the time of this graduation, said that a good caliber of men were graduating from the school. He congratulated them on their fine achievement.

M. B. Walker, assistant director of signal engineering, BN, asked the graduates to share their knowledge with others of how signals work.

Keith Sletten, director of personnel development, congratulated the men on their graduation.

Bill Pearson, retired engineer signal construction, BN, told the graduates that their learning is just beginning.

General Chairman Bill Class presents graduates with Brotherhood of Railroad Signalmen's recognition certificate of completion of the Burlington Northern signal training program.

Hans Thomsen, assistant director signal engineering, told the graduates that they are good assurance that BN signaling is in good hands for the future.

Bill Class (left) congratulates Charles M. Van Belle, local 188.

Patrick P. Snipes (right) local 119, gets a certificate from Bill Class.

Rodney Madsen, manager of labor relations, congratulated the graduates and wished them well in their signaling careers.

John Unze (right) Twin Cities region gets Bill Class' best wishes.

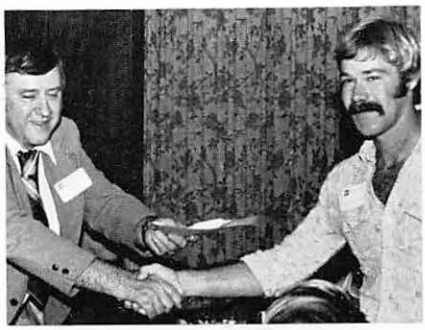
Bill Class congratulates Bill Dowdell of Local 154.

Robert L. Schmidt, manager signal training, thanked the graduates for their fine cooperative spirit and wished them well on their return to the field with a greater knowledge of signaling. In return, the class presented him with a desk pen set. Marshall Casler, signal training supervisor, received a key chain as a token of appreciation.

Dennis Neumann (right) Twin Cities Region receives handshake and certificate from Bill Class.

Bill Class (left) congratulates Dick Harms, local 119, as Charlie Dunn, BN director of signal engineering, applauds.

Graduates get BofRS recognition certificates



Bill Class (left) gives certificate and handshake to Gary Bushmeyer of Local 103.

Leo Yudysky (right) of Local 87 receives hand shake and a BofRS certificate from Bill Class.

Harry Harwick (right) Local 154 gets Bill Class' congratulations.

Paul W. Clanin of Local 103 gets handshake from Bill Class.

Signal RS&I

RS&I tests are made to assure that signal systems are functioning properly and to assure that vital controlling devices are being maintained within the safe tolerances prescribed by federal law. It has been well established that the best and most reliable method known to provide a safe signal system is through regular periodic maintenance, testing and inspection. Most of us can attest to numerous instances wherein unsafe operating conditions were discovered while performing regular maintenance duties. In some cases, the routine performance of RS&I tests has even been instrumental in discovering circuit design flaws and installation errors absolutely critical to the safe movement of trains.

J. L. Bryant, retired signal & train control inspector, during the days when jurisdiction of signal systems was under the Interstate Commerce Commission, has written to TSJ describing a few incidents where tests performed while he was present at certain interlockings revealed errors in design or errors made during the wiring of circuit changes in the field.

At one large electro-pneumatic interlocking, a switch had been added inside the plant. Although the circuit changes for the interlocking had been checked and had been in service for several months without any derailment or failure, a route locking test (Signal RS&I Section 236.379) revealed that for some routes over the newly installed switch, route locking was not effective.

At another large plant where a panel-type control machine with plug-in relays replaced a lever-type machine with mechanical locking, the circuits were designed and cases wired by the equiipment manufacturer. Installation of equipment was by the railroad's signal forces under supervision of a signal company representative and carrier officials. The interlocking was tested and checked out before placing in service, again under carrier official supervision. Yet, about a year later, tests revealed that route locking was not effective for a particular crossover move in the plant.

A similar incident occurred at a remotely controlled junction where it was discovered that route locking was ineffective for a crossover move. Again the error was revealed through route locking tests which are required every 3 months. There is no question that an added benefit of RS&I tests is they may reveal possible error in wiring or design, as well as assuring that the devices are functioning as intended.

Signal Training Bulletins

In cooperation with Committee G— Education & Training of the Communication & Signal Section, Association of American Railroads, The Signalman's Journal is publishing Signal Training Bulletins. These Bulletins are prepared by members of Committee G who are primarily signal training instructors.

The objective of the Committee is to make available to the railroad industry a source of concise training bulletins to assist in the development of new employees, such as assistant signalmen. These Signal Training Bulletins cover signal devices and when possible will include typical basic circuits.

All Signal Training Bulletins published in The Signalman's Journal have been or will be approved for publication by the C&S Section, AAR Committee of Direction.

Beginning with this issue, the Signal Training Bulletins will be published in each issue of The Signalman's Journal. They will be found on special ivory paper in the center of the magazine. These Signal Training Bulletins can easily be removed from each issue and inserted in a standard 3-ring notebook for keeping.

The following schedule indicates the order in which these Signal Training Bulletins will be published in The Signalman's Journal, beginning with the September 1978 issue:

Signal Training Bulletin D-1: Track Circuits.

B-1: Primary Battery—Carbon Cells and B-3: Secondary Battery—Lead Acid Cells

B-4: Secondary Battery—Nickel Iron and B-5: Secondary Battery Nickel Cadmium

A-2: Insulated Rail Joint; A-1: Bond Wire; and A-4: Resistor

C-1: DC Neutral Relay—General; and C-2: DC Neutral Relay—Magnetic Structure

C-3 DC Neutral Relay—Contacts

C-4: DC Neutral Relay—Operating Characteristics

B-6: Transformers

B-7: Rectifier and B-8: Charging Nickel-Cadmium and Nickel Iron Batteries

B-9: Charging Lead Acid Batteries

B-10: Primary Battery System with Rectifier; A-5: Lightning Arresters; A-6: Fuse

This is just the beginning series of Bulletins. As more become available, we shall alert you to our schedule for printing them.

From time to time, these Signal Training Bulletins will not make up into four pages, which is the space that will be used for their publication in The Signalman's Journal. Occasionally extra space will be provided for you to make notes, work out problems or jot down specific values of resistors, meter readings, etc. that you find to be correct for the operation of track circuits, relays, for example.

Publication of these Signal Training Bulletins is intended to be a practical training tool for you. We hope you make good use of them. We welcome your comments. Write to Robert W. McKnight, Editor & Manager, The Signalman's Journal, 601 West Golf Road, Mt. Prospect, IL 60056.

Communication & Signal Section, AAR

Committee G: Education & Training

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Signal Training Bulletin

COMMITTEE G: Education & Training
Communication & Signal Section, AAR

D-1 Direct Current Track Circuit

Approved April 1975

Definition: An electrical circuit of which the rails of the track form a part.

Symbol: None.

Description: As shown in Figure 1, the circuit consists essentially of a section of track, a battery and adjustable limiting resistor at one end, and a relay and adjustable relay resistor at the other end. The section of track used in the circuit is separated, electrically, from adjacent sections of track by insulated rail joints placed in each rail at each end of the section. The individual rails within the section are bonded together at the intermediate rail joints, by means of bond wires, to form continuous reliable conducting paths.

Note: Figure 1 shows a variable resistor in the battery and relay leads. Although the relay resistor is most often installed in new installations many roads have track circuits in service with a battery resistor only. Also some roads use a fixed resistor in place of the variable resistor at the battery end.

Purpose and Application: The primary purpose of a track circuit is to detect the presence of a train in the track circuit section. It also provides a means of detecting a broken rail.

The track circuit is a very important link between moving trains and wayside signal equipment. Some important applications of the track circuit appear in block signal systems, highway crossing protections, interlockers, etc.

General Information: Although the track circuit appears to be a simple series electrical circuit, it is in fact quite complex. The rails, which are the main conductors, are mounted on ties, placed on ballast, and as ties are not perfect insulators, the resistance to ground is subject to considerable variation. This provides an infinite number of paths for current leakage between the rails through the ballast. When the ballast is wet, dirty or contains a high metallic content, this leakage may increase to a point where the relay current will be reduced to the extent that the relay will drop without train occupancy. Conversely, under very dry or frozen conditions, this interrail leakage will be at a minimum permitting maximum current to flow in the relay coils. If the electrical circuit is improperly adjusted—erratic relay operation will result. That is, enough current would continue to flow through the relay coils which are in parallel with the shunt provided by the trains wheels and axles. It is therefore extremely important the circuit be properly adjusted.

The variable limiting resistor at the battery end and the variable relay resistor at the relay end provide the facility to properly adjust the track circuit. Each railroad has instructions on the proper method and values for track circuit adjustment and it is important that every employee be familiar with these instructions.

In addition to the circuit adjustment, it is important that every signalman recognize the importance of regular inspection of the circuit components. Because the bonds, joints and track leads are susceptible to damage and wear from dragging equipment, work equipment and normal train travel, it is very important that these components be maintained in good order. Frequency of inspections also differs between railroads and signalmen should know the requirements of their company.

Detailed Operation: As mentioned earlier, the primary function of the track circuit is to detect the presence of a train in a track section. Figures 2 and 3 illustrate a simple example of track circuit operation in which a signal at one end of a track circuit govern train movements into that section.

With the armature up, a secondary circuit, fed from an operating battery, is established through the TR front contact and a lamp behind the green lens of the signal. The green aspect of the signal would indicate to an approaching train that it is safe to proceed.

Should a rail within the track circuit be broken, the signal will display a red aspect because once again current will not flow in the relay coil and the secondary circuit will be made through the back contact.

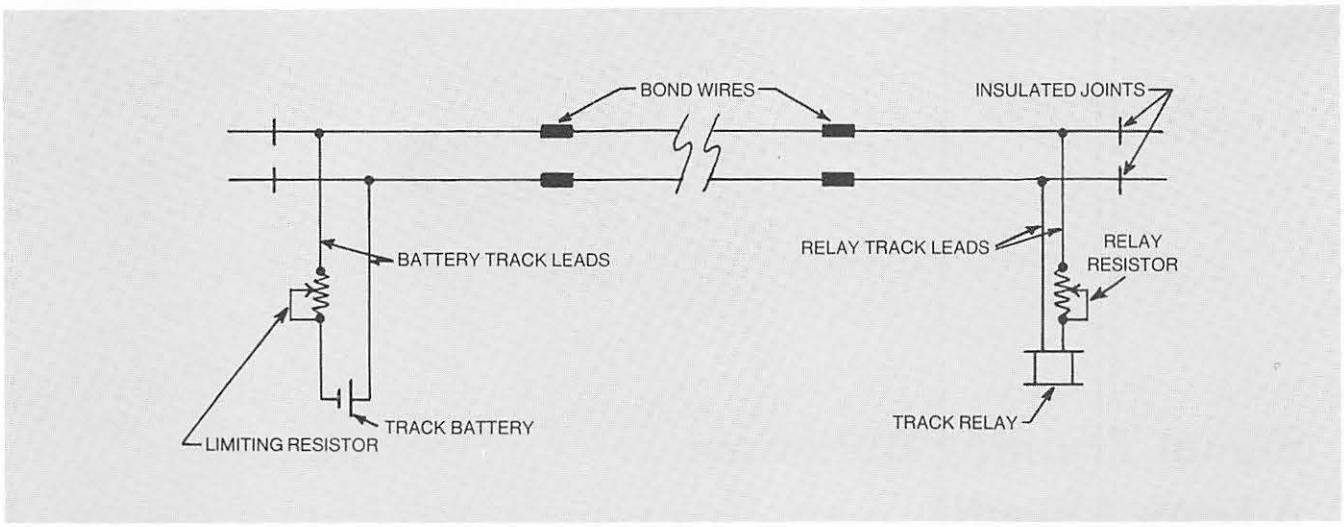


Figure 1: Typical direct current track circuit.

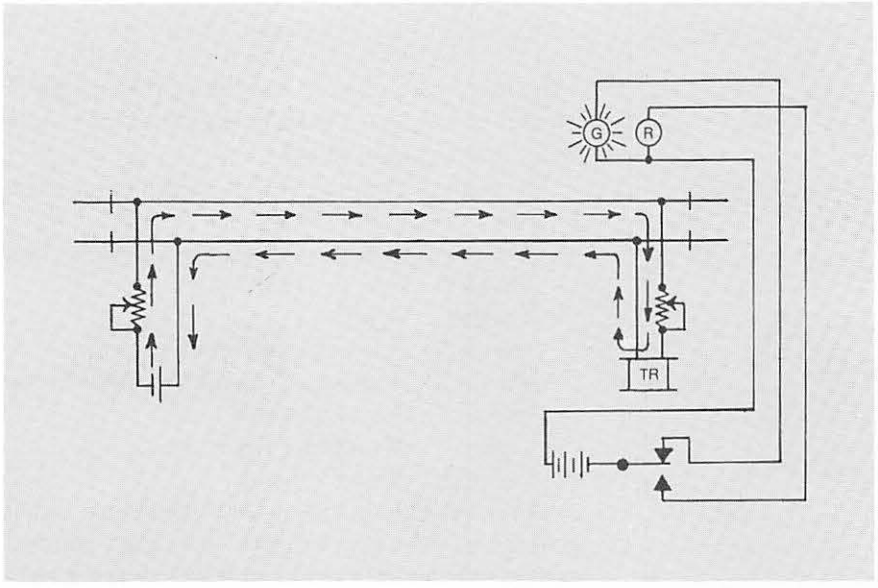


Figure 2 illustrates normal track circuit conditions. That is, there is no train in the circuit, therefore current from the track battery has a complete path through the rails and track relay coil as shown by the arrows. The presence of current in the relay coil produces the necessary electro-magnetism to pick up the relay armature which closes the front contact of the track relay.

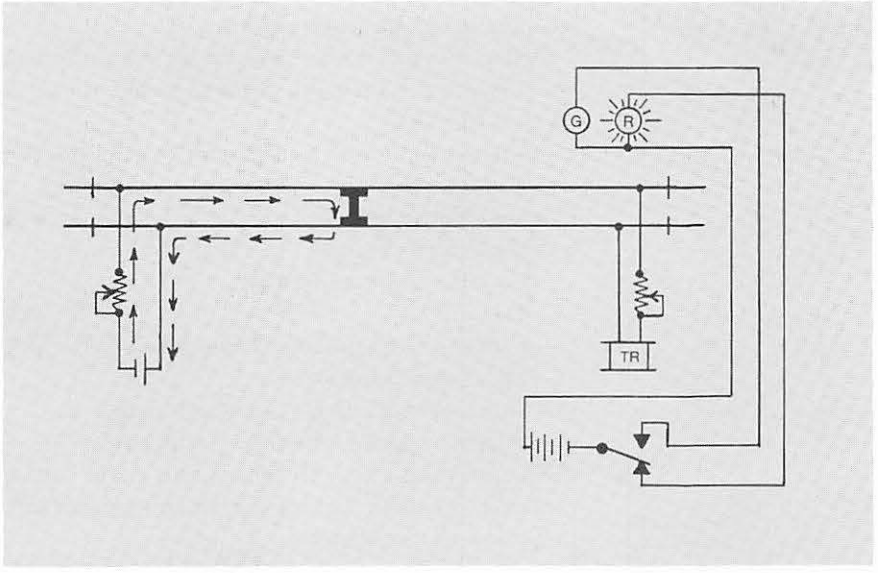


Figure 3 illustrates the effect of a train occupying the track circuit. Note that the arrows now indicate that the current flow is through the rails and the train wheels and axle. The current through the relay coil has been shunted out by the train. The relay coil loses its electro-magnetism and the armature drops, which closes the back contact. This opens the secondary circuit to the green signal and closes a current path to the lamp behind the red lens to indicate stop to a following train.

Signal Training Bulletins: A Look Ahead!

On the front page of this introductory Bulletin is a publication schedule. However, a little background information may be of interest, plus a look into the future.

The Signal Training Bulletins are categorized into eight series, as follows:

—Series A: Signal Devices and Signal Accessories
—Series B: Energy Distribution
—Series C: Relays
—Series D: Basic Signal Circuits
—Series E: Highway Crossing Warning Systems
—Series F: Signal Systems
—Series G: Measuring Instruments
—Series H: Miscellaneous

The order of publication is designed on a building-block approach to give the student or trainee the necessary information to understand a system or a device. For example, the dc track circuit is presented to give an overview of the track circuit. This Signal Training Bulletin is followed by others that provide information about the components that make up the track circuit.

Other subjects to be covered by Signal Training Bulletins include the following: (Note: No order of publication has been determined for these subjects.)

—Meters including multimeter, voltmeter, ohmmeter, ammeter.
—Relays: Biased, dc neutral slow release, flasher, interlocking, motor and electro-magnetic timer, polarized neutral, power transfer or power off, and thermal.
—Switch circuit controller
—Derail
—Power switch machines: models DA-10, M3, M23AA and M23B
—DC coded track circuit
—Audio frequency track circuit- general
—Highway grade crossing warning systems: wig wag, flashing-light

For the long term, Bulletins will cover automatic block signaling, centralized traffic control, interlockings, and safety detectors, to name just a few of the subjects.

Dear Mr. President:

AMERICA'S HEALTH CARE SYSTEM IS SICK.

The people of the United States today pay more for health care than for national defense. And that, Mr. President, is a lot of money—billions of dollars. What has that vast sum of money bought us?

You, Mr. President, on April 16, 1976, described it accurately. You called it "A haphazard, unsound, undirected, inefficient non-system that has left us unhealthy and unwealthy at the same time."

The facts prove how right you are. Despite the high bills we pay, the U.S. now ranks 17th in the world in life expectancy for males, 10th for females and 15th in infant mortality.

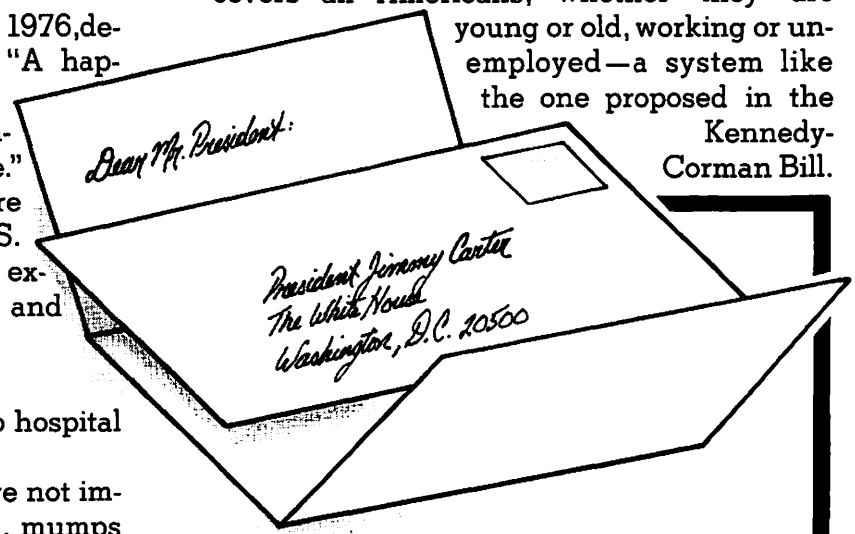
It's a national disgrace that

- 40 million Americans have no hospital or surgical protection whatsoever
- 40 per cent of our children are not immunized against measles, diphtheria, mumps or polio
- elderly Americans are shunted off to high-profit nursing homes, often dreary warehouses that confine people until they die
- that the U.S. is one of only two countires in the industrial world without a national health system (the other is South Africa)
- some 138 counties in the U.S. have no medical practitioner of any kind . . . doctor, nurse, dentist
- the poor of the big cities are often turned away from emergency rooms of private, profit-making hospitals because they are on welfare or have no health insurance.

You can change all of this, Mr. President, when you ask Congress in mid-1978, as you promised, to reform our antiquated and dangerous health care system. You can do it by proposing National Health Security, as provided in the Kennedy-Corman Bill.

As you know, under National Health Security, no American would ever again pay a hospital bill or a doctor's bill.

We in the Committee for National Health Insurance are urging citizens to write to you, supporting your efforts to build a health care system that is efficient, less expensive and covers all Americans, whether they are young or old, working or unemployed—a system like the one proposed in the Kennedy-Corman Bill.



As an American, concerned about the state of your health and your family's health, as well as your pocketbook, write to President Carter today. Urge him to propose National Health Security to protect your family—all American families—against the hazards of illness and bankruptcy.

COMMITTEE FOR NATIONAL HEALTH INSURANCE
821 15th Street, N.W.,
Washington, D.C. 20005 • 202-737-1177

HEALTH ★ SECURITY PROGRAM

DOUGLAS A. FRASER, Chairman
LANE KIRKLAND, Secretary
MRS. ALBERT D. LASKER, Vice Chairman
VERNON E. JORDAN, JR., Vice Chairman
JESSE L. STEINFELD, M.D., Vice Chairman

From the Secretary-Treasurer

How to apply for retirement benefits

When the time comes for you to retire, you will want to start receiving your annuity from the U.S. Railroad Retirement Board as soon as possible. Delays can be avoided if you know what steps to take and what documents to bring when you apply for benefits. The following questions and answers describe these steps and documents and will be helpful to railroad employees planning their retirement.

(1) I'm just starting to think about my retirement plans. When should I first contact the Railroad Retirement Board?

It would be best to contact the nearest district office of the Railroad Retirement Board a few months before you intend to retire. That way, you can be sure that the records regarding your age and railroad service are in order. A Board representative will be pleased to prepare an annuity estimate for you and your spouse, explain your benefit rights and answer any questions you may have.

To locate the nearest Board office, look in your telephone directory under "United States Government" listings or check with your employer, your local Post Office or the nearest Federal Information Center.

(2) What documents will I be required to submit when I actually retire?

For an employee annuity, you will be required to submit proof of your age and, if you had active service in the Armed Forces, proof of your military service. If you are applying for a disability annuity, Board personnel will give you instructions for obtaining supporting medical evidence.

When your husband or wife applies for a spouse annuity, he or she will have to provide proof of age and marriage.

(3) What are suitable proofs of age, marriage and military service?

The best proof of age is a certified copy of the civil, church or hospital record of your birth that was made at, or near, the time of your birth. If such proof is not available, you should present the oldest records that you can locate, such as a census record, a school record, an insurance policy, a military discharge paper, a fraternal organization record, and any other similar types of documents. It is advisable to contact a Board office a year or two before you plan to retire if you do not have suitable proof of your age so that you will not miscalculate your eligibility date, or work past your supplemental annuity closing date. This is also important for Medicare purposes.

Proof of military service may be the original or a copy of the certificate of your discharge, or of any official military record, that shows the dates of your active service.

The best proof of marriage is a certified copy of the public or church marriage record or the original marriage certificate.

It is advisable to assemble these proofs in advance of your retirement so that you will have them available when you apply for your annuity.

(4) Will I have to establish proof of my railroad service?

The Board has a record of your railroad service after 1936. If you had railroad service before 1937, you can file a statement with the Board to claim credit for such service. The form on which this statement is made (Form AA-15) can be obtained from any Board office. If you have already filed this statement or if you will have 30 or more years of service after 1936 at retirement, it will not be

For United States residents only:

Allow 6 weeks for change to take effect. Form ML-1 Rev. 6/67

Moving? Let us know!

Please send your new address to:
Brotherhood of Railroad Signalmen,
601 W. Golf Rd., Mt. Prospect, IL 60056

Name _____

Street or Box No. _____ **Apt. No.** _____

City _____ **State** _____ **Zip** _____

Lodge No. _____ **Certificate No.** _____

necessary for you to submit this statement. Otherwise, you should file this statement a few months before you actually retire.

(5) What steps should I take when I'm ready to actually retire?

When you are ready to actually retire, you must leave your railroad job and usually, any nonrailroad job you have. However, if you are self-employed in your own unincorporated business, you may not need to give up that work. You may also continue to serve as an elected public official in the United States.

You must relinquish your rights to return to railroad service and relinquish any other employment rights unless you are under retirement age and applying for a disability annuity.

You must also file a retirement application with the Board.

(6) What do you mean by "relinquishing rights" to railroad service?

When you stop working to apply for an annuity, you sign a statement that you are giving up your rights to return to work for any employer covered under the Railroad Retirement Act. You will be assisted in completing a form on which this is done when you apply for your annuity. It is necessary that you relinquish those rights before you can begin receiving your annuity.

(7) When do I actually file my annuity application?

The best time to file for your annuity is immediately after you stop working, not before that time. If you file for your annuity before you stop working, this can delay the payment of benefits to you, since you would have to file an additional statement later, verifying that you had stopped working and had relinquished your rights to return to work.

(8) How soon after I apply will I begin receiving my annuity?

Payment at an estimated rate generally begins a few weeks after an application is filed. When final calculations are completed, generally within 60 to 90 days of filing, any additional amounts due are paid retroactive to the annuity beginning date.

For disability annuities, no payment is made until all medical evidence has been evaluated. This usually takes at least 60 to 90 days since medical records have to be obtained from your doctor and hospital. The Board may also ask you to report for medical examinations. However, once disability has been established, benefit payments are made retroactively.

(9) My husband is a railroad employee. If he were to die, how would I apply for benefits for myself and our children?

It would be best for you to visit a Board office in person. If there is not a Board office near your home, call or write the closest office for information and assistance.

You would have to furnish proof of your marriage and a funeral director's statement or a copy of the death certificate as proof of your husband's death. For your children, you would supply birth certificates as proof of the relationship and age of each child. If you are disabled or have a child who is age 18 or over and disabled, special medical evidence of the disability would also be needed. Proof of your age and your husband's military service may also be required.

Unemployment & sickness aids

July 1 was the start of the 1978-1979 benefit year under the Railroad Unemployment Insurance Act. This Act, which is administered by the U.S. Railroad Retirement Board, provides cash benefits for qualified railroaders who become unemployed but are able to work and available for work, and for employees who are unable to work because of sickness or injury.

The following questions and answers describe railroad unemployment and sickness benefits and explain how to apply for these benefits.

(1) What are the service and earnings requirements for railroad unemployment and sickness benefits in the 1978-79 benefit year?

Normal benefits starting July 1978 are based on an employee's railroad service and earnings in calendar year 1977. To qualify for normal railroad unemployment or sickness benefits, you must have had railroad earnings of at least $1,000 in calendar year 1977, not counting more than $400 for any month. If you were a new employee in 1977, you must also have worked in at least 5 months of that year (not necessarily full-time in each month).

Under certain conditions, railroaders who do not qualify on the basis of their 1977 earnings may still be able to qualify for benefits in the 1978-79 benefit year.

(2) I do not have the 1977 earnings needed to qualify for normal railroad unemployment or sickness benefits in the benefit year which began July 1, 1978. Is it still possible to receive benefits during the current benefit year?

If you received normal benefits in the previous benefit year, extended benefits may be payable under certain conditions. Or, if you have 10 or more years of service and are not currently qualified because of insufficient 1977 earnings, but would be qualified in July 1979 based on your 1978 earnings, you may start the next benefit year early. For example, if you earned less than $1,000 in 1977 but earned $1,000 or more in 1978, counting earnings only up to $400 a month, you could be eligible to receive benefits in the current benefit year which began July 1, 1978. However, sickness benefits paid on this basis are terminated at age 65.

If you think that you may be eligible for benefits, you should file an application; the Board will notify you regarding your eligibility.

(3) What is an employee's daily benefit rate for unemployment or sickness?

An employee's daily benefit rate is 60% of his last daily rate of pay in the qualifying base year (generally calendar year 1977) up to a maximum daily benefit rate of $25. The minimum daily benefit rate is $12.70.

Benefits can be paid for up to 10

days in a two-week registration period so the maximum amount of benefits for a two-week registration period is $250.

(4) How do I apply for unemployment benefits?

You should register with a railroad unemployment claims agent during the first week you are unemployed; otherwise, you may lose some benefits. There is probably a claims agent where you were employed or your former supervisor can direct you to an unemployment claims agent.

Ordinarily you register once each week, as instructed by the claims agent. If your normal registration day falls on a day when the claims agent's office is closed, you must register on the next business day. If possible, bring your most recent Certificate of Service Months and Compensation (Form BA-6) with you when you first register with an unemployment claims agent.

(5) How do I apply for sickness benefits?

If you don't have them now, obtain the orange-colored sickness application forms (Form SI-la&b) from your railroad employer, railroad labor organization or any Board office to keep on hand in case you become ill. Your family should know where these forms are kept and how to use them on your behalf if necessary. Also, it's a good idea to keep your latest BA-6 form, Certificate of Service Months and Compensation, with the applications. The BA-6 form shows your social security number and includes instructions on how to claim benefits.

If you become unable to work because you are sick or injured, complete the application, have your doctor complete his part of the form, and mail it to the Board within 7 days of the first day for which you want to claim benefits. Enclose the right-hand portion of your BA-6 form, but do not delay sending the application if you cannot locate you·BA-6 form; delayed filing could cost you benefits.

(6) How long are normal unemployment or sickness benefits payable?

Normal unemployment and normal sickness benefits are each payable for up to 26 weeks in a benefit year. For the 1978-79 benefit year, the total amount of each kind of benefit which may be paid cannot exceed your 1977 earnings counting earnings only up to $775 per month.

(7) What happens if I exhaust normal benefits and am still unemployed or sick?

An employee with 15 or more years of service who exhausts normal benefits may be paid unemployment or sickness benefits during an extended benefit period of 26 consecutive weeks. With 10 to 14 years of service an extended benefit period for unemployment or sickness would last for 13 consecutive weeks.

During periods of high unemployment in either the national economy or the railroad industry, an extended unemployment benefit period of 13 consecutive weeks may be available for employees with less than 10 years of service, but the unemployment benefits paid may not exceed half of such employee's base-year earnings, counting earnings up to $775 a month. Since periods of high unemployment can change from time to time, current information as to whether extended unemployment benfits are payable to employees with less than 10 years of service should be obtained from the nearest district office of the Railroad Retirement Board.

To be eligible for extended unemployment benefits, an employee must not have voluntarily retired or have left work voluntarily without good cause.

To be eligible for extended sickness benefits, an employee must be under age 65 and must not have voluntarily retired.

(8) How are railroad unemployment and sickness benefits financed?

Railroad employers pay the entire cost of the unemployment and sickness benefit program. Currently, railroad employers pay a tax of 8% on the first $400 each employee earns each month to finance the railroad unemployment and sickness benefit program. Railroad employees are not taxed for unemployment and sickness benefits payable under the Railroad Unemployment Insurance Act.

Christmas Seals Fight Lung Disease

HOLIDAY HAZARDS

From Halloween to Happy New Year, American homes abound with snack foods, peanuts, candies, trinkets and toys. Attractive to toddlers. And dangerous.

Such small objects can stick in the throat, causing choking—even death. Or be inhaled into the lungs to cause serious trouble.

Protect preschoolers by keeping such items out of their reach.

Your Christmas Seal gift also helps defend young lungs. When the colorful seals created by American schoolchildren arrive, be generous.

AMERICAN LUNG ASSOCIATION®
The "Christmas Seal" People
We care about every breath you take

Where to get help from the U.S. Government

For more information

When you have questions about any program or agency of the Federal Government, you may want to call the Federal Information Center (FIC) nearest you. The FIC information service helps consumers locate the right agency—usually Federal, but sometimes state or local—for help with problems.

ALABAMA	
Birmingham	205-322-8591
Mobile	205-438-1421
ARIZONA	
Phoenix	602-261-3313
Tucson	602-622-1511
ARKANSAS	
Little Rock	501-378-6177
CALIFORNIA	
Los Angeles	213-688-3800
Sacramento	916-440-3344
San Diego	714-293-6030
San Francisco	415-556-6600
San Jose	408-275-7422
COLORADO	
Colorado Springs	303-471-9491
Denver	303-837-3602
Pueblo	303-544-9523
CONNECTICUT	
Hartford	203-527-2617
New Haven	203-624-4720
DISTRICT OF COLUMBIA	
Washington	202-755-8660
FLORIDA	
Fort Lauderdale	305-522-8531
Jacksonville	904-354-4756
Miami	305-350-4155
Orlando	305-422-1800
St. Petersburg	813-893-3495
Tampa	813-229-7911
West Palm Beach	305-833-7566
GEORGIA	
Atlanta	404-221-6891
HAWAII	
Honolulu	808-546-8620
ILLINOIS	
Chicago	312-353-4242
INDIANA	
Indianapolis	317-269-7373
IOWA	
Des Moines	515-284-4448
KANSAS	
Topeka	913-295-2866
Wichita	316-263-6931
KENTUCKY	
Louisville	502-582-6261
LOUISIANA	
New Orleans	504-589-6696
MARYLAND	
Baltimore	301-962-4980
MASSACHUSETTS	
Boston	617-223-7121
MICHIGAN	
Detroit	313-226-7016
MINNESOTA	
Minneapolis	612-725-2073
MISSOURI	
Kansas City	816-374-2466
St. Joseph	816-233-8206
St. Louis	314-425-4106
NEBRASKA	
Omaha	402-221-3353
NEW JERSEY	
Newark	201-645-3600
Trenton	609-396-4400
NEW MEXICO	
Albuquerque	505-766-3091
Santa Fe	505-983-7743
NEW YORK	
Albany	518-463-4421
Buffalo	716-842-5770
New York	212-264-4464
Rochester	716-546-5075
Syracuse	315-476-8545
NORTH CAROLINA	
Charlotte	704-376-3600
OHIO	
Akron	216-375-5638
Cincinnati	513-684-2801
Cleveland	216-522-4040
Columbus	614-221-1014
Dayton	513-223-7377
Toledo	419-241-3223
OKLAHOMA	
Oklahoma City	405-231-4868
Tulsa	918-584-4193
OREGON	
Portland	503-221-2222
PENNSYLVANIA	
Allentown/ Bethlehem	215-821-7785
Philadelphia	215-597-7042
Pittsburgh	412-644-3456
Scranton	717-346-7081
RHODE ISLAND	
Providence	401-331-5565
TENNESSEE	
Chattanooga	615-265-8231
Memphis	901-521-3285
Nashville	615-242-5056
TEXAS	
Austin	512-472-5494
Dallas	214-749-2131
Fort Worth	817-334-3624
Houston	713-226-5711
San Antonio	512-224-4471
UTAH	
Ogden	801-399-1347
Salt Lake City	801-524-5353
VIRGINIA	
Newport News	804-244-0480
Norfolk	804-441-6723
WASHINGTON	
Seattle	206-442-0570
Tacoma	206-383-5230
WISCONSIN	
Milwaukee	414-271-2273

Interlocking: Basic Circuits

Switch Control

Switch control is accomplished through a polar controller in the machine, operated over wires NW and RW, Figure 919. When the position of relay WZR is changed from normal to reverse, the NWC relay will drop, closing the circuit to pick up relay LS, providing relays 2TP and L are both up. Battery is applied to switch-controller wires NW and RW over front contacts of relay LS. With the WZR in the reverse position, wire NW will be minus with respect to wire RW and thus positions the controller to connect motor wires BW and CW to operate the points to the reverse position.

When the machine locks up in the reverse position, in correspondence with relay WZR, relay RWC will pick up to remove energy from relay LS. The dropping of relay LS disconnects battery from the switch machine and shunts its control wires to protect against false operation from crosses.

Back contacts of relays RGZR and LGZR are included in the control of relay L to deenergize this relay when an attempt is made to clear a signal. This is to permit including a back contact of the L relay in the signal-control circuits to check that the locking is in force before a signal can be cleared.

Home Signal Controls

Home signal controls check the proper alignment and locking of the switches in the route, the opposing home signal at stop and the condition of the block to the next signal in advance.

Referring to Figure 920, let us assume that signal 1RA is to be cleared to the right over the switch normal. Placing the control lever in the right position picks up relay RGZR, which drops relay L, closing the circuit from 1RA signal coil over a front contact of 2TP, a front contact of 1LAS to check that opposing signals are at stop, back contacts of relays L and LS to check that energy is removed from the switch machine, front contact of relay NWC checking that the switch points are over and locked normal in correspondence with the switch control, front contacts of the track relays of the section between the plant and signal 45, then to battery over front contacts of clear repeater of 45 signal 45YGP. With 45YGP up, the polarity on the circuit is such that 1RA will display a green aspect. With 45YGP down, indicating that signal 45 is displaying a stop aspect, its directional stick relay 45S must be up to apply a polarity such that signal 1RA will display a yellow aspect.

It will be noted that had the switch been reverse, RWC up, and NWC down, a local circuit including the

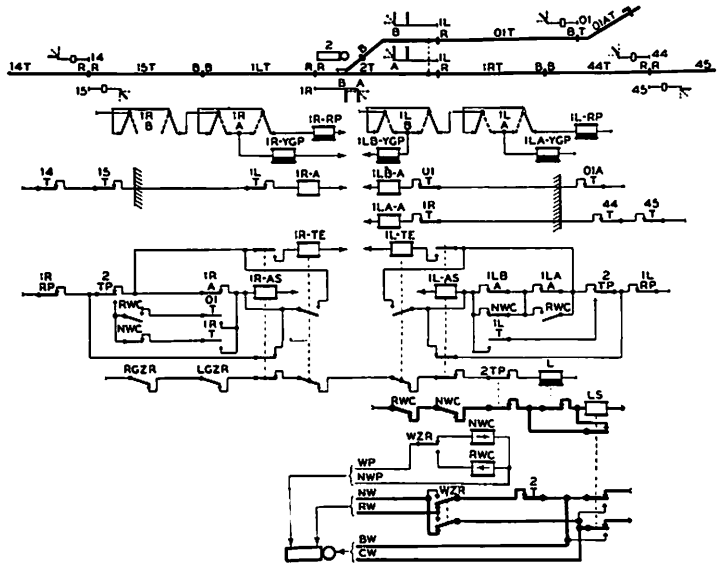


Fig. 919: Relay interlocking locking and switch control circuits.

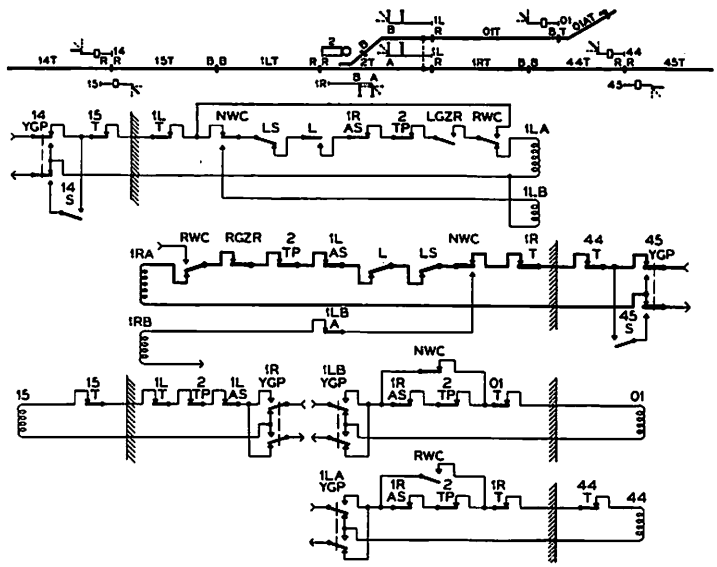


Fig. 920: Relay interlocking signal control circuits.

plant selections would have been closed to the coil of signal 1RB over a front contact of 1LBA to check the condition of the branch line to the extent that it is track circuited.

The control of the left signals is similar to that just described for the right signals except that both left signals receive polar energy from the signal in advance.

Approach Signal Controls

Approach signal controls, Figure 920, are taken over front contacts of all track relays between them and the opposing home signals. A front contact of the opposing

AS is included to insure that opposing home signals are at stop. The circuits are then pole changed on the home signal YGP relays so as to cause the approach signals to display approach (yellow) aspects when the home signals are at stop and proceed (green) aspects when the home signals are clear.

When the opposing AS relay or the track relay within the plant is down for a route that does not conflict with an approach signal, it is shunted out of its circuit by front contacts of the NWC or RWC relays, as shown in the controls of signals 01 and 44.

The circuits discussed and shown here are typical for a small plant and become more complex as the plant increases in size with more functions to be controlled, but the fundamental principles involved remain the same.

Interlocking: Entrance-Exit

INTRODUCTION

The basic idea behind NX was that a route has an entrance and an exit. The term NX was coined by the General Railway Signal Company from the first syllables of the words *en*-trance-*ex*-it. On a miniature track diagram is placed an entrance knob at every possible entrance and an exit button at every exit. The entrance knobs are physically represented by interlocking signals on the ground.

ENTRANCE KNOBS

A stationary arrow in the middle of the entrance knob indicates the direction in which the signal governs. The entrance knob can be manipulated in four ways as shown in Figure 921. Each manipulation has a distinct purpose, thus:

1. PUSHED—When the route is lined up by pushing the entrance knob and the exit button, the passage of the first train over the route restores everything to normal. Hence, this manipulation provides automatic route restoration.

2. PULLED—When the route has been lined up by pushing the entrance knob and the exit button, and the operator decides to cancel the route, he may do so by pulling the entrance knob. If the train is not already on the approach track, he can immediately line up another route for it; otherwise he must allow a predetermined time to elapse before trying to line up another route.

3. TURNED UP—When the route is lined up by turning the entrance knob up, the route is held for a succession of trains. The signal is given for high- or medium-speed moves and repeatedly clears after each train leaves the block. Everything is restored to normal manually by turning the entrance knob back to normal, except that route locking of switches remains in effect as required by ordinary interlocking practice, and is so indicated on the panel.

4. TURNED DOWN—When the route is lined up by turning the entrance knob down, the route is again held for a succession of trains, and the signal is given for low-speed moves only. This signal may or may not be track-circuit controlled, depending on railroad practice. Everything is restored to normal manually by turning the entrance knob back to normal, except that route locking of switches remains in effect.

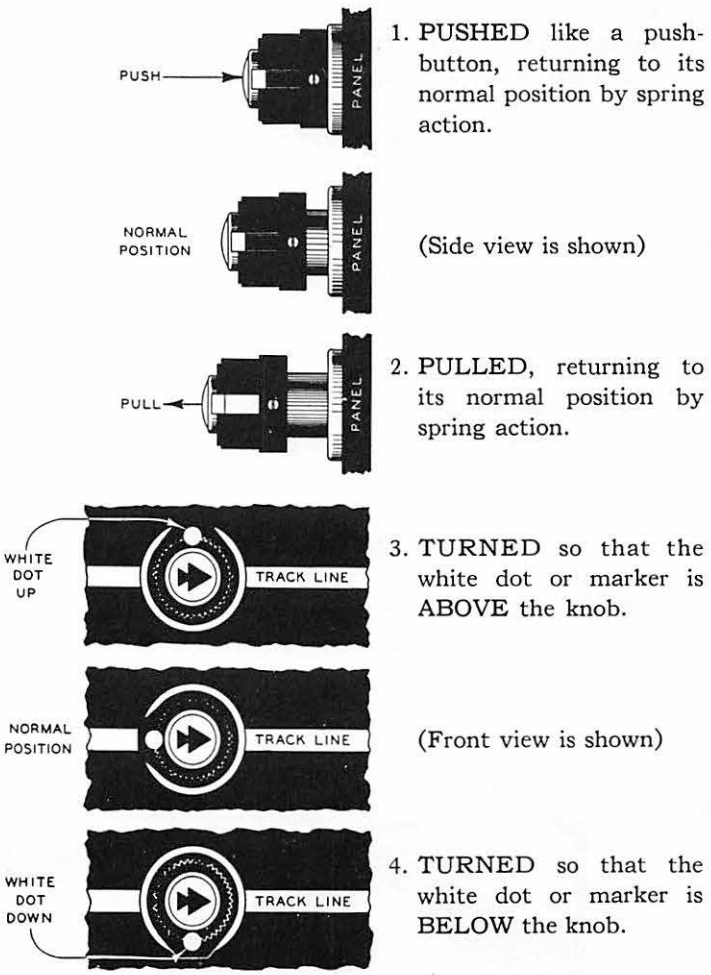

PUSH
PANEL
1. PUSHED like a push-button, returning to its normal position by spring action.
NORMAL POSITION
PANEL
(Side view is shown)
PULL
PANEL
2. PULLED, returning to its normal position by spring action.
WHITE DOT UP
TRACK LINE
3. TURNED so that the white dot or marker is ABOVE the knob.
NORMAL POSITION
TRACK LINE
(Front view is shown)
WHITE DOT DOWN
TRACK LINE
4. TURNED so that the white dot or marker is BELOW the knob.

Fig. 921: Entrance knob manipulations.

The entrance knob can be provided with all four manipulations, or only as many as are required for the purpose. The operator is able to line up routes with characteristics that suit the demands of traffic. If a succession of trains is to use the same route, he turns the entrance knob and holds the route. If each train requires a new route, he pushes the entrance knob and allows the train to restore everything to normal.

Entrance Knob Indications

The entrance knob may be provided with one lamp to display a single color, or with two lamps to display two

different colors. There are three conditions that may be indicated by lights in the entrance knob (1) the route is initiated, (2) the route is complete and (3) the signal is clear.

With one lamp, usually white, in the entrance knob a flashing light indicates the route is initiated and a steady light indicates the signal is clear.

With two lamps in the entrance knob, two types of indications are available: (1) a steady red light indicates that the route is initiated and a steady green light indicates that the signal is clear, (2) a flashing red light indicates the route is intitiated, a steady red light the route is complete but the signal has not yet cleared, a flashing green light the low-speed signal is clear, and steady green light indicates that the high- or medium-speed signal is clear.

EXIT BUTTONS

The exit button is a simple pushbutton of the spring-return type. An arrow on its face shows the direction in which the train leaves the route.

TEST KEYS

Switches can be thrown individually by means of test keys. Switches in transit are indicated by the switch correspondence lights.

PANEL INDICATIONS

Indications in the panel tell when a route is lined up, when a route is locked up, when the switch is in correspondence, when track circuits are occupied and available exit points.

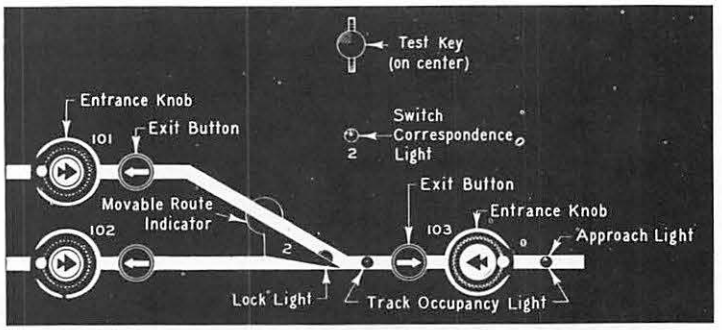
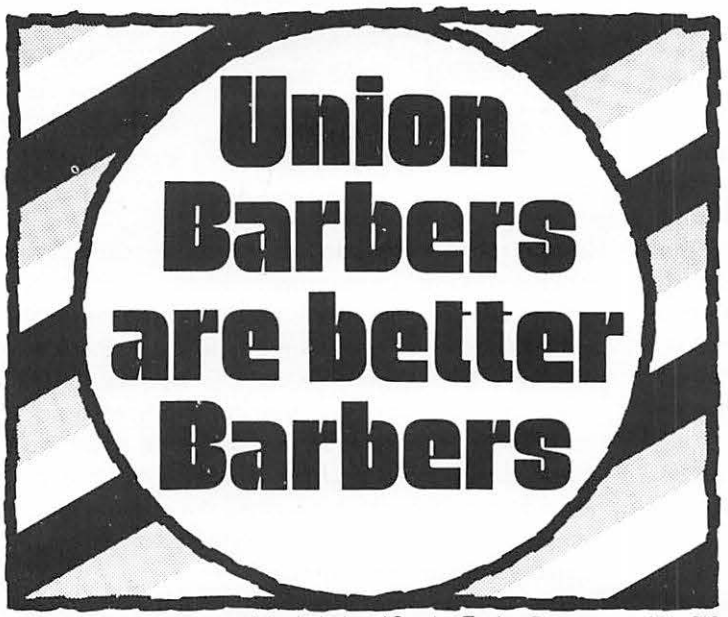


Fig. 922: Movable route indicator panel.

On the movable route indicator panel in Figure 922:

1. The route lined up is shown by the movable route indicator, which snaps into position called for by the route when the operator presses the exit button. When no route is called for, it indicates switch position.
2. The route locked up is shown by the illumination of the lock light at the point of the route indicator.
3. The illumination of the switch correspondence light shows that the switch is out of correspondence with the position called for by the route. It may be in transit or stalled. the same light is illuminated if a maintainer hand-cranks the switch machine in the field, and it remains illuminated until the switch machine is cranked back into correspondence.
4. Track occupancy is indicated by the illumination of the track occupancy lights.
5. The indication of available exit points can be provided by the use of an exit button which contains a light. The light is illuminated (after initiation has taken place) in every exit button to which a route may be lined up.

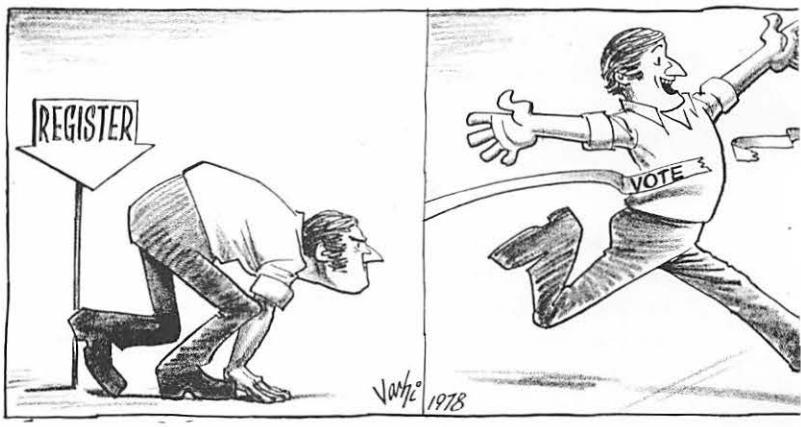


Union Label and Service Trades Department, AFL-CIO

Signalman Sam says: "Light bulbs must be changed each year. Also, better not forget my yearly contribution to the Signalmen's Political League."

Food for Signalmen

Editor's Note: The following recipes comes from the fine cooking skills of Marge and Chuck Chandler. He is BofRS vice president in Eddyville, KY. This is the first of many recipes to see print in The Signalman's Journal. We invite you to send us your favorite recipes, but no guarantee when they will be published. Good eating!



Amalgamation Cake

(This recipe may be doubled for double amount of cake layers or for two or more cakes)
3 sticks butter (¼ lb. each stick)
2 cups sugar
6 eggs
1 pint seedless blackberry jam
4 cups sifted all purpose flour (sifted 3 times)
2 tsp. soda
1 tbsp. cinnamon
1 tbsp. allspice
1 cup buttermilk
½ cup finely chopped pecans

Cream butter until soft and add sugar and mix until both are well creamed. Add beaten eggs, one at a time and then add the jam and mix well. Sift the dry ingredients together and add alternately with the milk and mix well. Add nuts and bake in 4 cake pans (8") that have been greased and wax paper lined for 20 to 30 minutes in pre-heated 350 degree oven.

Amalgamation Cake Icing

1½ cups pecans
1 can Bakers coconut or frozen coconut
1½ cups raisins (seedless)
½ pint whipping cream
8 egg yolks
2 cups sugar
2 sticks butter

Place nuts, coconut and raisins in large bowl and set aside. Mix other ingredients well and cook in double boiler over hot water until thick. Remove from heat and pour over mixture in large bowl that was set aside and mix well. Spread between layers and over top and sides of cake. NOTE: THIS CAKE WILL SPOIL IF NOT KEPT IN COOL PLACE OR REFRIGERATED. IT SHOULD BE BAKED A MINIMUM OF TWO WEEKS PRIOR TO SERVING AND LONGER IF POSSIBLE. IT IS BETTER WHEN 3 TO 4 WEEKS OLD.

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Children's diseases can be cut via immunization

Editor's Note: This the third and final article in the series dealing with the prevention of children's diseases through immunization. The other articles were printed in the June and July-August issues of The Signalman's Journal.

Widespread use of polio virus vaccines since 1955 has resulted in the virtual elimination of paralytic poliomyelitis in the United States. To ensure continued freedom from the diseases, it is necessary to pursue regular immunization of all children from early infancy.

Q. What causes polio?

A. Polio is caused by a tiny virus, a disease-producing agent that must get inside a living cell in order to reproduce.

Q. Is there more than one type of polio virus?

A. Yes. There are 3 known types of polio virus. They tend to attack cells in the intestinal tract and in the central nervous system. It is when they get into nerve cells that they cause paralysis.

Q. What is non-paralytic polio?

A. A usually mild illness caused by polio virus but without development of paralysis. Polio occurs frequently in its non-paralytic form.

Q. Is polio still a danger?

A. Yes, if people do not get their children immunized, because naturally occurring polio viruses are frequently imported into the United States.

Q. How many polio vaccines are there?

A. Two, an injectable polio vaccine given by shots and an oral polio vaccine given by mouth.

Q. Who should get the oral polio vaccine?

A. All unimmunized well persons between the ages of 6 weeks and 18 years of age except:

1. Those with cancer or leukemia or lymphoma,
2. Those with diseases that lower the body's resistance to infection.
3. Those taking drugs, such as cortisone, that lower the body's resistance to infection.
4. Those with household contacts who have one of the above problems.

Q. Who should get the injectable vaccine?

A. 1. People who should not get the oral polio vaccine (see above) who need polio vaccination.

2. Unprotected adults traveling to a place where polio is common and who have time (2 months) for a full series.

3. People for whom oral polio vaccine is recommended but who still prefer the injectable vaccine. The worst choice for these people would be to remain unvaccinated.

Q. When should the oral polio vaccine be given?

A. INFANTS: The 3-dose series should be started at 6-12 weeks of age, commonly with the first dose of DTP. The second dose should be given not less than 6 and preferably 8 weeks later. The third dose is an integral part of primary immunization and should be administered 8-12 months after the second dose or at approximately 18 months of age.

CHILDREN AND ADOLESCENTS: For unimmunized children and adolescents through high school age, the series is 3 doses. The first 2 should be given 6-8 weeks apart and the third, 8-12 months after the second.

Q. How does the oral polio vaccine work?

A. After it is swallowed, it is absorbed into the bloodstream, where it goes to work building up what doctors call "antibodies." These are what provide long-lasting protection against polio.

Q. How long after a person takes the oral polio vaccine does it become effective?

A. The oral polio vaccine provides some protection immediately by interfering with the naturally occurring polio viruses. Long-lasting protective "antibodies" build up in 2 to 3 weeks.

Q. Can there be serious side effects from the oral polio vaccine?

A. Yes, very rarely. Once in about every 3 to 5 million vaccinations, persons who have been vaccinated or who come in contact with those who have recently been vacinated are permanently crippled and may die.

Q. Why is oral polio vaccine recommended?

A. The risk of side effects from the vaccine must be balanced against the risk of the disease, both now and in the future. Most polio experts feel the use of oral polio vaccine is the most effective way to control polio in the United States.

Q. Do the polio vaccines provide protection against all types of polio?

A. Yes, the vaccines provide immunity against all 3 forms if all of the recommended doses of vaccine are given.

Mumps

Q. What causes mumps?

A. Mumps is caused by a virus. People get it through contact with someone who already has the disease.

Q. How do I know if I've had

mumps?

A. It is possible that you had mumps and never realized it, and it is possible that you think you had mumps and really didn't. The only way to be sure is for your doctor to take a blood sample and have it analyzed. However, the special test required is not always available and it is not practical for everyone to have the test done on them.

Q. Can other disorders cause symptoms similar to mumps?

A. Yes. The swollen glands, headache, earache, loss of appetite and fever that commonly occur with mumps can also be caused by other conditions. This is one reason why it is difficult to know for sure whether or not you've had the disease.

Q. Can mumps cause deafness? If so, how common is it?

A. Yes. Impaired hearing, usually in only one ear, is estimated to occur in one out of every 300 to 400 cases of mumps. That doesn't seem like very many, but mumps is one of the leading causes of deafness in children

Q. Does mumps, like measles, cause meningitis?

A. The most common complications of mumps are those associated with the nervous system—encephalitis, encephalomyelitis, and meningitis. These forms of inflamation of the brain are more common, although almost always less severe, with mumps than with measles. They may be accompanied by such symptoms as stiff neck, headache, dizziness, delirium and convulsions. Most patients recover completely, but a few are left with permanent damage to the nervous system.

Q. What are the other complications of mumps and how serious are they?

A. In addition to meningitis and hearing impairment, mumps sometimes causes inflammation of the testicles in men and the ovaries in women. Im most people, these complications are troublesome but they usually do not cause permanent damage or sterility. Very rarely, arthritis or inflammation of other organs may be observed.

Q. How significant is the risk of sterility from mumps?

A. Orchitis, or inflammation of the testicles, is a common complication of mumps. About one percent of young boys with mumps experience the condition, but a substantial 20 or 30 percent of adult males with mumps suffer from orchitis. The condition is extremely painful and is often accompanied by severe swelling. Orchitis may cause permanent damage to the testicles, which infrequently leads to impaired fertility.

Q. Can females as well as males suffer the complications of mumps?

A. Absolutely. The common belief that mumps is not dangerous to girls and women is a myth. The brain inflammation, hearing impairment and other complications can occur in females as well as males.

Q. Is mumps ever fatal?

A. Yes. Experts calculate that mumps is fatal in about 2 to 4 of every 10,000 cases. Ten to 30 deaths are reported to occur each year from the complications of mumps.

Q. Does mumps have a specific pattern of attack?

A. Mumps is a very unpredictable disease. Epidemics occur but do not follow any pattern or cycle. In general, mumps is more prevalent in the spring and early summer months.

Q. Can mumps be controlled?

A. Once someone has mumps there is little that can be done but to let it run its course. But mumps can be prevented by administration of live mumps virus vaccine.

Q. Who should receive mumps vaccine?

A. The live virus mumps vaccine is especilly important for young children, but is also recommended for older children and adults who are still susceptible to the disease.

Q. When should mumps vaccine be given?

A. It should not be given to children less than one year of age, but is commonly administered at the age of 15 months with measles and rubella vaccine.

Q. How is the vaccine administered?

A. It is injected into the upper arm or thigh. Mumps is often given through use of a combination vaccine for measles, mumps, and rubella. Only one injection is needed for protection against all three diseases.

Q. How effective is the live virus mumps vaccine?

A. The vaccine has an excellent record of effectiveness. It has produced the antibodies needed for protection in 97 percent of the children vaccinated and 93 percent of the adults.

Q. How safe is the vaccine?

A. Over 22 million doses of mumps vaccine were given in the United States from 1968 through 1974. Mild fever occurs occasionally, but high fever is uncommon. Other more serious reactions have been noted very rarely—less than one in every million doses of vaccine.

Q. How long does the protection last?

A. The people who were vaccinated during the trials of the live virus vaccne more than seven years ago still have the protection-giving antibodies in their blood. This indicates that protection may be permanent. However, more time will be required to know for sure.

Rubella

Q. Is rubella really important?

A. Rubella (German measles) is a common and relatively mild disease of childhood. When adult women get the disease, however, it can become serious. Rubella virus can cause babies to be born with abnormalities

or the pregnancy can end in stillbirth or miscarriage. The greatest danger lies in a woman's getting rubella during the first few months of her pregnancy. Some of the common defects of rubella-affected babies are cataracts, deafness, heart defects, and mental retardation.

Q. What is the difference between common red measles and rubella?

A. They are two different diseases caused by different viruses. Measles is a serious rash disease of children which may lead to complications, such as a loss of hearing, pneumonia, or encephalitis. Rubella is a mild, three-day infection which seldom causes complications in children. When a child gets either disease he develops natural immunity for life.

Q. Does rubella have a pattern of attack?

A. Most cases of rubella occur in school-age children, most frequently during winter and spring months. By early adulthood about 80 to 90 percent of persons in the United States have been infected by the rubella virus and have developed immunity.

Q. Does rubella occur in epidemics? If so, what are the results?

A. Some rubella cases occur every year. Past evidence shows, however, that large outbreaks come every six to nine years in the United States. The last major epidemic, in 1964, was probably the largest in 30 years. We estimate that 20,000 to 30,000 infants were born with severe defects from the 1964 epidemic. From the cyclical character of rubella, another large increase in cases was anticipated in the early 1970's. As yet no such increase has been observed, partly due to large scale immunization programs.

Q. What are the symptoms of rubella?

A. About one-half of all infected children have a very mild illness and their parents do not know that they have had rubella. Other children usually develop a low grade fever, swollen glands in the back of the neck and a rash that lasts for about 3 days. About one child in 10 may develop painful or swollen joints. When rubella occurs in adolescents or adults, however, the painful or swollen joints are noted in about one in every two persons. Rarely, unusual bleeding at the site of cuts may occur. About one in every 6,000 persons with rubella will develop encephalitis or inflammation of the brain.

Q. How safe is the vaccine?

A. Over 69 million doses of rubella vaccine have been given in the United States. A small number of children (about five percent) experience transient pain of a single joint, often the knee, after receiving rubella vaccine. This side effect is more common in teenagers and adults. Other more serious side effects such as encephalitis or increased bleeding occur very rarely, about one in every million doses of vaccine administered. If a woman is vaccinated in early pregnancy, the fetus can be infected although it is not yet known whether or not this can lead to births defects.

Q. How can the pregnant woman and her unborn baby be protected?

A. Preventing exposure of the pregnant woman is the principal objective of rubella control. Because of the possibility of risk to the pregnant woman and to her developing baby, the best means of protecting the fetus is by reducing the likelihood of the mother becoming infected. This can be done best by eliminating the major source of infection for pregnant women. Children are the principal reservoirs of the disease and should be vaccinated. Emphasis should also be placed on vaccinating women *before* they get pregnant.

Q. Who should receive rubella vaccine?

A. Rubella vaccine is most useful for children between one year of age and puberty. Vaccine should not be given to infants less than one year old because maternal antibodies may prevent a "take." It is usually given with measles and mumps vaccine at the age of 15 months. A history of rubella illness is not reliable enough to exclude children from being immunized. The vaccine should not be given to pregnant women nor to women who may become pregnant within two months following immunization.

Q. If a young woman requests rubella vaccine should it be given to her?

A. A physician could consider such a request if he determines that vaccine is needed. He should realize that only 15 to 20 percent of young adult women remain susceptible to rubella, and that a woman who receives vaccine should not be pregnant nor become pregnant for at least two months. A laboratory test should be used to establish the need for vaccine, and if the vaccine is given, the patient should be alerted to the likelihood that she could experience temporary joint pain or other reactions two to four weeks after vaccination.

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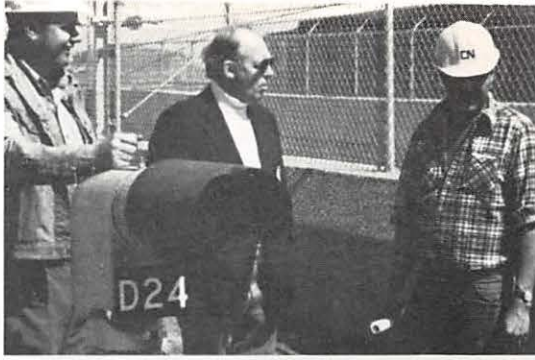
News from Canada



Robert R. Mitchell (center) BofRS grand lodge representative talks with Darrel Kai (right) and John Whitton.

Edmonton lodge 202 holds summer meeting.

At its July 22 meeting Edmonton lodge 202 members were told that R. J. Stasiuk and Ray Magnan had become new members of the local. Vice president J. E. Platt discussed demands that have been sent to Canadian National Railways as well as bringing members up-to-date on matters of interest including a review of the noon day meal. After reading of a letter from Quebec, North Shore & Labrador local 217, members voted to donate $100 to local 217's strike fund. A special meeting will be called on September 9 to discuss items for the agenda of the Canadian General Committee meeting to be held in Toronto later that month. Also local 202 had received a letter from J. MacPherson, recording and financial secretary of local 192 suggesting that the two locals have a union party to include members in British Columbia and Alberta. This will be discussed at the September 9 meeting. Local 202's books were audited by Brothers John Whitton, D. Elkin and D. VanWelleghem and checked by Robert R. Mitchell, grand lodge officer. H. A. Tracz, local chairman, conducted the meeting which was attended by John Whitton, David Elkin, Robert R. Mitchell, John E. Platt, H. Werbicki, S. D. Fidler, R. W. Makowichuk, H. A. Tracz and recording and financial secretary R. J. Dube.

William J. "John" Whitton (left) signal helper, checks voltage reading on switch machine as Richard "Darrel" Kai, signal maintainer, checks circuit plans. They are members of Edmondon Local 202.

Darrel Kai (above) and John Whitton (below) make a meter check in interlocking bungalow.

John Whitton (left) and Darrel Kai check battery voltage in North Edmonton interlocking bungalow.

Signalmen at work in CN's Calder yard in Edmonton, Alta.

Canadian National's Calder yard in Edmonton is equipped with sound deflectors (in left foreground) to send retarder screech upward. Housing at master retarder has a roof to provide more complete sound entrapment.

Keith R. Lorenz, signal mechanic, makes some wiring changes on a terminal board.

Burman lodge 165 honors retired member Stuart Fox

Brother Stuart Fox was honored with a retirement party on May 26 by his colleagues in Burman Lodge 165. Brother Fox had spent 35 years with the Canadian National and at the time of his retirement was signal maintainer at Kitchener, Ont. He had also been very active in Brotherhood affairs.

John Kutz, recording and financial secretary, reports that this retirement party was attended by many of Brother Fox's fellow members in the local as well as Canadian National supervisory personnel. "We wish Stu and his wife Lois many happy years of retirement," says Brother Kutz.

Hugh James Moore, signal maintainer for the Canadian National at Simcoe, Ont. died recently. Brother Moore had completed 46 years service when he retired in July 1967. He was a member of Burman Lodge 165.

Brian E. Hill, leading signal mechanic, checks circuit plans as he is working with Lorenz on making wiring changes.

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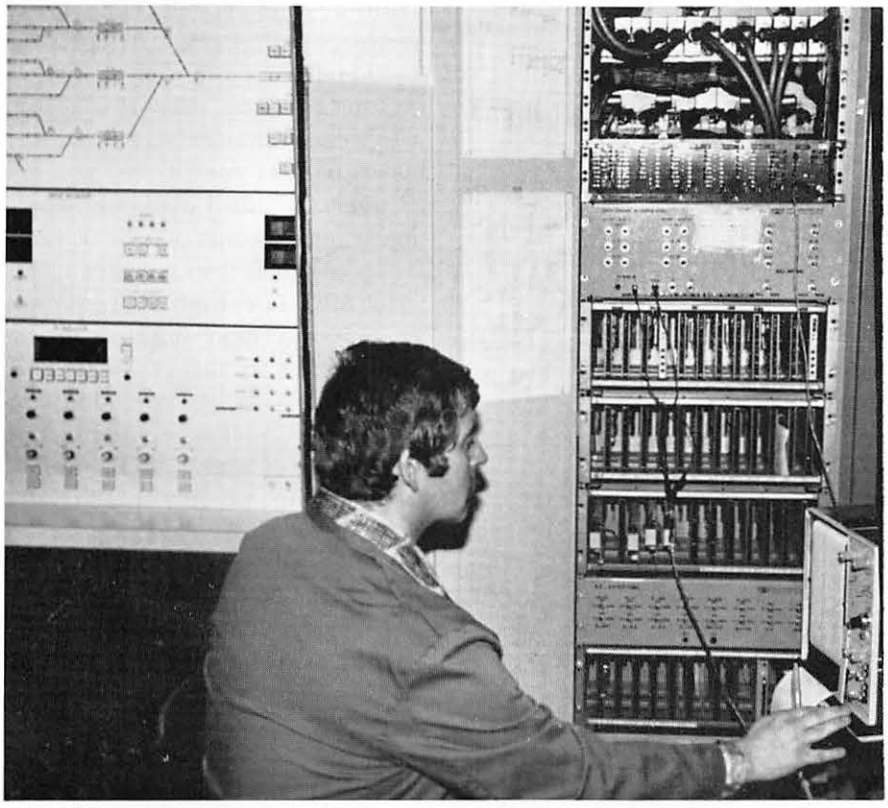
Stanley D. Fidler, signal technician, at Calder yard, modifies hotbox detector data panel to meet specs of new model 8808 pulse processor.

Kenneth A. Benusic, signal technician, Calder yard, maintains and repairs electronic equipment including automatic car identification scanners.



Leonard Carter, signal technician, monitors operations of the Calder hump computer, which is a Honeywell model 516.

Product News

Solid state charger is for 12-volt systems

McGraw-Edison has introduced a new charger for nickel-cadmium, nickel-iron, and lead-acid railway signaling and communications batteries. The solid-state charger, used on nominal 12 volt systems requiring 6 amp outputs, brings a battery to full charge from zero volts at ambient temperatures of -40 to +160 deg F.

Called the BC12-6A charger, the compact (13″ high; 7½″ wide; 5¾″ deep), lightweight (20 lb) unit has a built-in, automatic fold-back, current-limiting control that reduces the current output when abnormal conditions exist, thus preventing excessive wattage from being dissipated in the power transistors. The control becomes operative with low-voltage batteries or excessively high ac voltage. A thermal-sensing cutoff is activated at 130 deg C, making the charger temporarily inoperative, thus preventing damage to the charger components. When the tem-

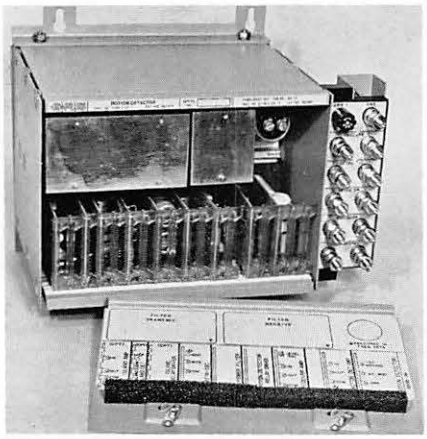
perature falls below 130 deg C, the cutoff automatically restores the charger to normal operation. Built-in surge protection in the charger (an MOV is connected across the ac terminals) eliminates the need for other-than-standard protection normally used at an installation.

For more information write Dept. TSJ, McGraw-Edison Co., Power Systems Division, P.O. Box 28, Bloomfield, NJ 07003.

Solid state relays are used for flashing lights

A line of solid state flashing relays for highway crossing and train control signal applications include the model 720 EOR flashing relay which is a self-regulating relay that costs less than electromechanical units, and is designed to give maximum performance under all conditions for dependable control of flashing lights. It has a built-in rectifier. Model 705 wayside signal flasher, for use in permissive signal aspect circuits assures top performance throughout a lifetime of demanding use. Model 1610 rectifier provides full-wave rectifier power for the load circuit of the model 705, where an ac source supplies power to the signal lamp(s).

For more information write Dept. TSJ, Western-Cullen-Hayes, Inc., 2700 West 36th Place, Chicago, IL 60632.



Motion detector is for highway crossing system

The new GRS solid-state train motion detector, for use with approach and island track circuits, automatically clears highway crossing warning devices when a train stops and/or reverses direction while on the approach to the crossing. Thus, delays of highway traffic are reduced during switching operations on the crossing approaches. A vital ring sustain timer keeps the crossing warning devices operating during momentary loss of track shunt or momentary train speed reductions below the detection threshold.

GRS approach frequency shift overlay (FSO) track circuits are recommended although other types, such as dc or ac rectified approach track circuits, may be used. Optional island occupancy and relay driver boards eliminate the need for separate island track circuit equipment.

The motion detector is available in eight frequency channels ranging from 164 to 760 Hz. The lower frequency channels provide train motion detection farther in advance of the crossing than the higher frequency channels. Depending upon ballast conditions and the frequency channel used, train speed in excess of 80 mph may be detected as far as 4,000 ft in advance of the crossing. The higher frequency channels are more sensitive to motion closer to the crossing and, depending on ballast conditions and the frequency channels used, train motion as slow as ¼ mph may be detected up to 100 ft from the crossing.

All eight frequency channels are compatible with all GRS frequency shift overlay frequencies. No insulated joints are required. The motion detector's highly selective transmit and receive track filters minimize harmonic frequency spillover and pick up of other channels — an important consideration in areas where multiple crossings are closely spaced.

Surge protection is provided. The detector can operate in areas with a minimum track ballast resistance of 5 ohms in 1,000 ft. It requires 9 to 15 volts dc at 600 ma. Detection sensitivity is adjustable.

For more information write to Dept. TSJ, General Railway Signal Co., P. O. Box 600, Rochester, NY 14602.

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Members who are injured on the job and the dependents of those members who have been killed or have died as the result of such injuries should by all means ascertain their rights and benefits under the Federal Employers' Liability Act before attempting any settlement with the railroad.

Below is a list of attorneys who, on the basis of information made available to us, are competent to give full information and assistance to those in need of it.

This list is compiled and maintained on the strength of information furnished us by both attorneys and members. The accuracy of the list that we will publish from time to time depends entirely on the information furnished us. Therefore, everyone concerned is urged to keep us informed regarding cases handled, nature of the case, terms of the settlement, commendations, criticisms, etc.

This information should be forwarded to R. T. Bates, president, Brotherhood of Railroad Signalmen, 601 West Golf Road, Mt. Prospect, IL 60056.

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Bates' Commentary

All members of railroad labor organizations employed by Norfolk and Western are being "put to the test" by N&W management. The Brotherhood of Railway and Airline Clerks struck the N&W on July 10, 1978, due to the failure of BRAC and N&W to reach agreement on schedule agreement revisions on that property. At the time this is being written (August 29), the strike has lasted 49 days and prospects for resolution of the dispute are not good.

This is the longest railroad strike in recent years, and a great deal of hardship is being experienced by railroad workers and employes of other industries affected by the work stoppage.

The strike has been supported by most, if not all of organized labor. We are proud that members of the Brotherhood of Railroad Signalmen have supported the strike, even though it has caused hardship to all of our members employed by the N&W. Our members recognize that one craft union in the railroad industry could not effectively stop railroad operation if all other crafts did not support the strike by refusing to cross picket lines.

Unfortunately, N&W has chosen to operate limited service with management personnel, and we understand that a number of accidents have occurred which may have been the result of unqualified personnel operating locomotives and trains.

On several occasions, N&W management personnel have contacted our members and pleaded with them to cross the picket lines and inspect, repair and test crossing signals to insure safety for the travelling public. Obviously, N&W is not truly concerned with the public's safety or they would simply stop train operation until the strike is settled and the signals can be tested and maintained. Such pleading is, in my judgment, a further effort by N&W to break the strike.

The Brotherhood of Railroad Signalmen is paying strike benefits to our members who observe the picket lines, and we support their actions.

BRAC President Kroll has stated, "I am most appreciative of the support of our members, and the officers and members of all the other rail labor unions during these difficult times."

We are proud that our members employed by N&W are supporting this strike.

Tom Bates

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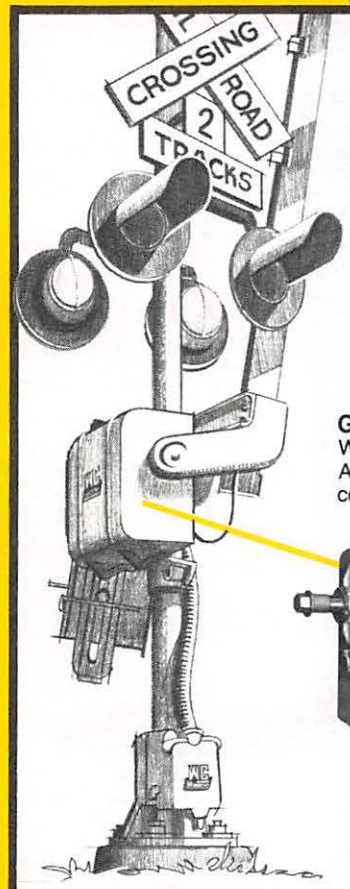

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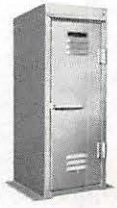

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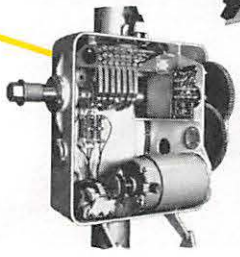

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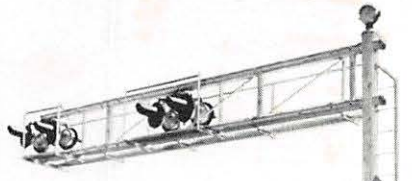

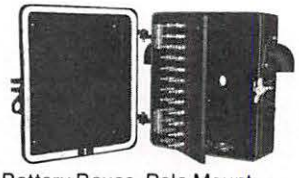

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